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WELLESLEY, MASSACHUSETTS
MAY 23,1891 APRIL 11,1918

TIFFANY & CO.

THE

FARMERS' REGISTER,

A MONTHLY PUBLICATION,

Devoted to the Improvement of the Practice

AND

SUPPORT OF THE INTERESTS OF AGRICULTURE.

EDMUND RUFFIN, EDITOR AND PROPRIETOR.

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VOL. VII.

PETERSBURG, VA.

PUBLISHED BY THE PROPRIETOR,

1839.

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FARMERS' REGISTER,

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EDMUND RUFFIN, EDITOR AND P R.

Vol. VII. JANUARY 31, 1839. No. 1.

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PETERSBURG, VA.
PUBLISHED BY THE PROPRIETOR,
1839.

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THE FARMERS' REGISTER.

VOL. VII. JANUARY 31, 1839. No. 1.

EDMUND RUFFIN, EDITOR AND PROPRIETOR.

ON THE CULTIVATION OF CORN.

Read before the Agricultural Society of Fredericksburg, and ordered to be published in the Farmers' Register.

The corn crop is so important to the tide water portion of Virginia, that observations upon its culture, however trite or desultory, can hardly fail to be productive of some benefit. The following are offered as the rusult of twenty years' experience, by one who has been a corn-grower for that time, and probably as successful as most of the farmers who live in the same section of country, and own similar land.

The field intended for corn should be ploughed up as early as possible. My usual practice is, to give the team a week's rest after the fall weeding is finished, then to start as many ploughs as I can, and to keep them at work whenever the weather will permit. I am thus enabled to get through with the wet and stiff land by Christmas, and to finish the residue of the field early in the spring. If wet land is postponed until the spring, it is often so late in drying, that the farmer becomes impatient, ploughs it out of order, injures the land and fails in the crop. As the ploughing advances, the small artificial drains to be found in most large fields should be well opened. If they are permitted to remain filled up with the earth thrown into them by the plough, small ponds of water, soaking through and injuring the land considerably beyond their limits, will be formed during the winter; which spots, being insufficiently dried when planted, will put forth sickly, unthrifty plants, and yield a very inadequate return. The depth of the furrow, must depend upon the charater of the soil. I believe the proper limits to be from three to six inches, having been satisfied from experience, that deeper ploughing sometimes injures the land, and always the team, without any benefit to the crop. A two-horse plough is fully adequate to such work, is less expensive, more easily managed by the ploughman, and less worrying to the team, than a larger one. Some other benefits resulting from this early ploughing, are, that the heavy work is done when the weather is cool and the days short, the plough horses are easily kept in good order, the land is loose and friable in the spring, and the farmer gets sufficiently advanced to be prepared for untoward occurrences and emergencies. This last advantage applies to all agricultural operations, and is so highly estimated, that I am not aware of any thing of more constant application or greater value to the farmer, than to admonish him to be beforehand with his work. If he starts or gets behindhand, he keeps so, and every thing, afterwards, is done out of time, or evinces a hurried and slovenly execution.

The field is ploughed in five-feet beds. I say this in reference to the corn-crop, and a level surface only. If wheat is the staple, other systems are probably preferable; and when the land is rolling, I have found no means so effectual, not for preventing, but for diminishing the great damage occasioned by heavy rains, as to avoid bedding and to preserve as much as possible, the natural surface. In the tide-water district, the corn crop is so decidedly superior, that it cannot be sacrificed to any other crop. The five-feet bedding exposes the land more effectually to the action of frost in winter, and of the sun and winds in spring. The crop can therefore be planted earlier, comes up and grows off more rapidly, sooner matures, and has a better chance to escape our frequent and severe droughts. Although good crops are made by earlier and later planting, the proper time for that operation is certainly the month of April; in the first half of the month, if the soil be sandy, in the latter half, if it be stiff. The modes of planting are various; but after trying most or all, I have given the preference to the plan of opening the beds longitudinally, with a single furrow of a plough, drawn by one horse, as deep as he can easily do it, dropping the grain by a line marked at the intended distances, each planter following his mark and covering with his foot. I prefer this method, because a horse going along the beds will do nearly twice as much work as when he crosses them, because every hand, (the two excepted who carry the line,) is a planter instead of being merely a dropper, because idlers are compelled to keep up with the industrious hands, because all are immediately under the eye of the overseer, because the grain is rarely covered too deep, as is often done by the hoe, and because fewer clods are left over it, the foot either pulverizing or rolling them off. Some exceptions to this practice will occur to every one. Very rough portions of the field must of necessity be covered with the hoe, and manured land cannot receive the longitudinal furrow without turning up a large part of the manure.

Experience has convinced me of the propriety of leaving at least two stalks to the hill. One half the labor of planting and thinning is saved, and, as the plough and cultivator can work across the beds, the team can perform much of the work usually done with the hoe. I believe the crop of corn is increased. Any one who will make a fair experiment, will find that corn planted five feet by six, with two stalks in the hill, will withstand the dry hot spells of our summers much better than if planted five by three with a single stalk. Last year, which was not a good one for corn, I made a trial on a large part of my field. The single-stalk corn fired earlier and more throughout than any other part of the crop, not excepting the portions containing many more stalks to the acre; and when stripped off, blade and top showed an evident inferiority. This conviction has induced me to plant thicker than is customary. The usual distance on thin soils of five and a half feet by three, will give 16½ square feet to each stalk. I plant such land five by five, with two stalks, giving 25 to the two, or 12½ to one. There are of course nearly one-fourth more stalks to the acre; and if, as I believe, each double hill will, in all respects, be at least proportionately equal to each single one, there must be a gain of nearly a fourth in the amount of product. Under these impressions, I invariably plant my thinnest land, except when changed for experiment, five feet by five, two stalks to the hill. This distance has been diminished on better land to five by four and a half, by four, by three and a half, by three, according to quality, always preserving the double stalks. The observation of the two last years has satisfied me, that whenever I have reduced the narrow distance to less than four feet, even on the richest land, I have lost by it, and has determined me in future to increase the number of stalks in the hills, rather than decrease the distance between them. When hills of corn are two and a half or three feet apart, the circulation of air is more impeded than if they were of double that distance; and an artificial heat is thus produced far exceeding the common temperature. This may be a reason for the superiority of the double to the single stalk planting. I have little hesitation in asserting, that during the last summer, our crops of corn sustained fully as much injury from the long spell of excessive heat, as from want of rain. In my neighborhood, the only long interval without good rains, was one of a month, between the 11th of July and 10th of August: and this interval was slightly relieved by occasional showers. I have, several times in my life, made very good crops, with droughts equally long, the corn retaining its color throughout. On the 11th of July, a very heavy rain fell, and yet within two weeks the crop was fired. This must have been owing to the extraordinary heat of the weather, and not at that time to drought.

As soon as the corn begins to come up, I start as many single horse ploughs as I mean to work, running one furrow on each side of the row, along the beds, and with the bar to the hill. They are started thus early, to diminish the depredations of the feathered tribe, as well as in accordance with the rule of keeping ahead. Crows and blackbirds may be seen travelling along the newly made furrows, dividing their attacks between the worms and insects turned up, and the young corn plants, but giving the preference to the former. Having gone over the field, a cultivator is then used, going in the opposite direction, or across the beds, twice in a row if the distance between the hills is as much as five feet, and once if less. The hoe follows rapidly, as nothing need be touched, but a small space around the hill. Much of the thinning is done in weather too wet for ploughing or hoeing, and the residue during the progress of the first hoeing. The next operations are, to return the earth, or greater part of it to the corn with the single plough, and again to follow slightly and rapidly with the hoe. This process is completed by harvest, and although it requires two hoeings, they are both so slight as not to exceed, in manual labor, what is necessaryfor the single one, when one only is given. If the land has been well broken up, I prefer these frequent, rapid, and slight workings, to fewer but deeper ones. During harvest, the plough finishes the narrow slip left in many of the rows, and the cultivation may be considered as over, so far as the crop of corn is concerned. A very shallow working afterwards, with the skimmer, or cultivator, and hoe, is usual; but rather designed to aid the seeding of wheat, than to benefit the corn, unless the latter is unusually backward. This year I could perceive no difference between that portion of my crop which received this past-harvest-culture, and that which did not.

The kind of corn cultivated, I believe to be of greater importance than is generally supposed. Any Virginian who has travelled northwards, must have observed the difference between their crops and ours. He must have seen that the stalks diminish in size, while the crop, per acre, obviously increases; and yet ours is notoriously the soil and climate for growing corn. I think the difference may be attributed to the kind of corn cultivated, a kind which enables them to plant much thicker than we do. Here, most of us plant a large gourd-seed corn, shooting up a tall large stalk, bearing generally one, occasionally two ears, and not admitting thick planting. There, the stalk is low, is planted very thick, and bears two, three, and four small flinty ears. Not farther north than Pennsylvania, I have seen corn planted five feet by four, with three and four stalks to the hill. Counting three stalks at this distance, and allowing three ears to each, any given space, there, will yield seven or eight ears to our one; small ears certainly, but still, large enough to account for the great superiority in the product per acre. I commenced with the old full bred Virginia gourd-seed, and stuck to it for six or eight years; but finding that, on common land, many stalks were too late in curing, or did not ear at all, determined to change my seed. My next variety was the "Taliaferro white flint." This sort is touched with the gourd-seed, but is superior to it in having a smaller stalk, ripening earlier, bearing more ears, and a harder and heavier grain. I then tried what is called the "Alsop corn," resembling the Taliaferro in other respects, but somewhat smaller in stalk, and superior in number of ears, often producing two, three, and sometimes a greater number of ears. This corn I still plant. I made one experiment with the Maryland twin corn, and thought it as prolific as the Alsop; but the grain being lighter, and the stalk taller, it was abandoned. Last winter I purchased in Washington a small quantity of "Baden" corn, and planted with it a rich lot of about two acres. It came up and grew off well, was the tallest corn I ever saw, averaged five or six shoots to the stalk, and promised at one time to make a great crop. But it suffered nearly twice as much as the rest of my corn, from the heat or the drought of the summer, and was broken off by a wind in August, which did very little injury to the rest of the crop. It did not of course, fill or ripen well, and I fed it to hogs. But as it certainly had more shoots than any corn I ever saw, I have saved a small portion to plant again. Its great fault is, its extraordinary height. If it can be brought down to a proper standard, retaining its great number of shoots, it will probably turn out to be a very prolific variety.

It will readily be seen that I consider thicker planting than common, essential in making heavy crops of corn per acre. But think planting with a large kind is out of the question. At the same time, it must be borne in mind, that as we increase the number, we diminish the size of the ears, and add to the labor of gathering and husking. Every judicious farmer will decide, from experience, how far he can carry this process; and will stop as soon as he begins to doubt whether he is paid for his additional labor. Dismissing all speculation on this point, I believe we may safely plant any small variety of corn at the rate of one stalk to every ten square feet on tolerable land,

39.82
31.3

which would give about 4360 stalks, and from six to ten barrels of grain to the acre. I will only add in conclusion, that although I have frequently been deterred by the influence which custom exercises over the mind of every one, from planting corn as thick as I was inclined to, I have, in no one instance, exceeded the usual rate, without adding to the crop.

Wm. P. Taylor.

Caroline county, Va.

ON THE CULTIVATION, PRODUCT, AND USES OF BROOM-CORN.

Read before the Agricultural Society of Fredericksburg, and ordered to be published in the Farmers' Register.

The establishment of a broom factory, in the town of Fredericksburg, may probably render the culture of the broom-corn an object of some importance to the farmers in the vicinity. Thus far, we have had little or no practical knowledge of the extent of the crop which may be gathered from any specific quantity of land, or of the value of the product. Ten or twelve acres have been cultivated by Mr. C. H. Hunt and myself, the present year; but we have made no estimate as to the amount per acre, either of the brush, by which is meant the broom part, deprived of the grain, with about six inches of the stalk, or of the grain. Nor, had we procured this information, could it have been considered a fair experiment, or a safe guide, the land being thin and a good deal exhausted, and the season unusually dry and unpropitious. We design, the next year, to measure our land, and make a careful and complete experiment, the result of which shall be laid before the society. From information obtained from Connecticut, where this article is extensively cultivated, it appears that the product per acre ranges from 200 to 1200 pounds of the brush, and from 20 to 120 bushels of grain—ten bushels of grain being considered a fair estimate for every 100 pounds of brush. It is seldom that the quantity of brush falls below 400 pounds, and not often that it reaches to 1200 pounds—perhaps a fair average would be, 600 pounds brush, and 60 bushels of grain. The grain is considered at least equal to oats for horses and cattle, and superior to buck-wheat for hogs. It is not known what will be a fair average price for the brush in our market. The manufactory is yet in its infancy, and the proprietors have not ascertained what price the market for their brooms will justify them in giving for the brush. But suppose the price of brush, properly cured, of a bright and lively color, to be five cents per pound, and the quantity produced to be 200 pounds below the New England average, say 400 pounds per acre, the producer would get $20 for his crop, equal to five barrels of corn, at $4 per barrel, and 40 bushels of grain, in every respect equal to oats, for all purposes for which they are used on a farm. It was not my intention, however, in making this communication, to enter into any speculations as to the probable value of this crop, or to present estimates founded on data so imperfect and uncertain, but merely to state our actual experience, as limited as it is, of the value of the grain. We work mules altogether. Last year, we cultivated a few acres in broom-corn, from which we obtained over 100 bushels of grain. Since the first of January, our mules have been fed exclusively on this grain. For the first few months, it was ground and mixed with chop; but the stoppage of the mills, from the drought, rendered this mode of feeding impracticable, after the middle of July or first of August; since which time, we have fed on the grain, unground, moistening it with water, a few hours beforehand, to soften and cause it to swell and expand. The mules seemed as fond of it as of any orher food—have continued throughout in excellent order, and our manager informs us, they have worked with as much spirit and as briskly, as any which he has ever had the management of.

I fed my cow, also, on this grain, for some weeks, during which, there was a sensible increase of the quantity of milk, beyond what she yielded when fed on bran and chop, the usual food of our cows in town. In preparing it for the cow, boiling water was poured over it, and it was kept well covered in a close vessel, until the grain expanded and became soft. In this state she ate it with great avidity.

Ground, and properly prepared, it has been used as a substitute for corn-bread, by several individuals in our neighborhood, who speak very favorably of it. Its appearance, when cooked, is dark red, very similar to rye bread, and like it, it contains a considerable portion of mucilage and vegetable gluten, which I have no doubt renders it highly nutritious. Deprived of its husk, which gives it the dark color, by a process similar to that employed in cleaning rice and barley, it will probably become an agreeable and healthy article of diet, and a valuable substitute for Indian corn, which it very nearly approximates in taste.

Wm. Browne.

From the Virginia Herald.

EXTRACTS FROM THE ADDRESS TO THE AGRICULTURAL SOCIETY OF FREDERICKSBURG.

By James M. Garnett, President.

* * * * * * * *

A young friend of mine, whose word cannot be doubted, has lately communicated to me a fact in regard to this most invaluable plant, which fact is certainly new to me, a corn planter of fifty years standing, and I suspect to most others of my brethren; although we surely ought to know, by this time, every important particular relative to its nature, since Indian corn has been our chief staple in the largest portion of our state, ever since its first settlement by emigrants from the old "fatherland." *This fact is*, that the full grown stalks have, at least three or four roots, larger than the surface roots, which penetrate into the earth, almost perpendicularly, to the depth of a foot or more: my friend traced them fully twelve inches by actual measurement. Those roots, from the direction in which they grow, can rarely, if ever, be broken by any implement yet used in corn culture; and *this fact* seems to afford a satisfactory solution of *another fact*, which heretofore has never been accounted for, satisfactorily. It is, that corn should, most manifestly, be benefited by every working—during its growth, if the land be in a proper state—that is, neither too wet, nor too dry; although it is equally certain, that many of the lateral and surface roots—whose spongioles contribute to feed the stalks and grain, must, inevitably, be cut by any implement ever yet used in its cultivation. True it is, that *some* cut more roots than *others;* but to claim for any, that they cut no roots at all, is a pretension which none can be expected to believe who ever had any experience in the culture of corn. Now, if the health and vigor of the corn plants depended solely, or even chiefly, on the spongioles at the extremities of the surface-roots, each working, after these roots have spread nearly or quite across the beds—which they do before any one ceases to work them—every working then given, would do much injury instead of good. Unless, indeed, (as I formerly suggested,) the cutting process tended to multiply spongioles at the ends of the cut roots next the stalks, more than sufficient to compensate for the loss of the extreme feeders. If this conjecture be insufficient to explain the undeniable fact, that growing corn is much benefited by every working, when the land is neither too wet nor too dry, may we not consider the difficulty solved by the discovery that the largest roots, which probably produce the most spongioles, grow in a direction which saves them from ever being cut, unless by accident? But the dew roots (as some call them,) which grow around the first joints of the stalks, and are very rarely cut, likewise act as feeders; although this, I believe, is not the common opinion. Those persons, however, who doubt, may easily satisfy themselves by tracing the longest of these roots to their extremities below the surface; for they will there find small fibres with *their* spongioles; precisely similar to those surface roots which are generally supposed to be the only sources of food to their parent plants.

I cannot dismiss this highly important subject without earnestly endeavoring to impress upon the minds of all our brethren, the absolute necessity of continuing to make experiments, and many more than any of us have yet made, if we would become thoroughly acquainted with the nature and best management of the corn plant. That we are yet ignorant of many essentials to its most perfect culture and greatest production, is manifest to all but those obstinate, self-conceited blockheads who have persuaded themselves that they have reached the highest point of attainable knowledge on both points; and who are ready to reply to all attempts at instructing them—especially if in print—"Oh! *we* know all about corn; don't tell *us* any thing, *we* never read books! no, *not we!*"

But, to prove their ignorance, as well as our own, I need only ask the following questions.

Who has ever made any experiments sufficiently numerous and accurate to ascertain the best depth and distance for planting corn in the different soils most common among us, with a view to obtain the greatest product that each soil can be made to yield? Yet, upon these two circumstances, *depth and distance,* we are all certain, that the quantity of grain produced, must most materially depend? Again, who has ascertained, or even attempted it, by any trials approaching to certainty of results, whether it is best to cultivate high and dry corn land on ridges, or on a level surface? Again, who among us can say, from actual and accurate comparison, whether it is best to cross-plough, or to plough but one way? All, probably, would give some answer to these inquiries—showing that each had formed some opinion—satisfactory perhaps to himself; but I may venture to affirm, without fear of contradiction, that not a solitary man of the whole would be able to state any facts whatever upon which a corn-planter, conscious of his own ignorance and anxious to remove it, could confidently and safely rely. Here then are no less than three or four highly important matters relative to corn culture, of which all the corn-makers with whom I have ever conversed, are still so far ignorant, that no uniform and certain practice for similar soils and situations, can be adopted on their authority. As to *depth,* it is guess-work with *all,* and it will be found to vary several inches; while the distances in planting vary so much, even among the most experienced corn-planters, that 'tis manifest they act more from mere conjectural belief than any thing else. Much difference of practice yet exists in regard to all the points I have stated, which could not possibly be the case, if a sufficient number of experiments had been fully and fairly made to settle which method was best in each case. This surely is well worth attempting—at least by all who cannot rest self-satisfied, that our present stock of knowledge is full and complete, which I sincerely hope is not the case with a single member of our society—since the very basis—the great object of its formation—was *mutual instruction.*

The scripture injunction "*seek and ye shall find,*" is eminently true, not only of spiritual knowledge, but of every species which human beings are capable of attaining, and to no class of mankind is the frequent repetition of this most momentous truth more necessary than to ours; for the worst of our besetting sins is an overweening confidence in our knowledge of husbandry, and the consequent neglect of all the means essential to its improvement. Our secluded country lives, if long continued without interruption, serve only to cherish and confirm this self conceit, almost beyond all hopes of cure. The symptom which usually indicates this disease in its most inveterate state is, when the infected person is found, whenever an opportunity offers, constantly and most complacently, talking about "*his* methods, *his* system." When the disorder appears in this aggravated form, a recovery very rarely occurs, for there are only two modes of cure, and both of doubtful efficacy. The first is, to persuade the sufferer, if practicable, to go a little from home and examine *other men's methods and systems;* for he will then surely find either that *his,* upon which he has prided himself so much, as sole discoverer and practitioner, have really nothing new in them, or that they are much inferior to the methods and systems of many other persons of his own profession. The second remedy is, to tempt him to read (provided he can,) a few scraps or whole articles in print, about husbandry. If well selected, they may possibly coax him on to peruse a pamphlet or book or two on the same subject, when he will discover that the great bug-bear which he has always despised so much under the name of book-farming, is, in reality, neither more nor less than a well authenticated record of the best practices in every branch of husbandry, from the earliest ages to the present day. It is true that he would find some mere speculations,—some useless trash; but what books, except the bible, were ever yet exempt from these defects? Yet even the most illiterate believe books to be absolutely necessary to the perfection of every honest trade, profession and calling, under the sun. Strange then, most strange would it be, if *that* calling, upon whose prosperity even human existence itself depends, should be the only one which can prosper without books! The vainest fool that ever lived, if he were not an absolute idiot, would not fail to admit this, provided you could prevail on him to think long enough to form an opinion. How shameful—how disgraceful then is it, that any of our fraternity who are certainly *not fools*, should ever be found among the idiotic declaimers against the study of books on agriculture! This study would put him in possession of *one fact*, which of itself should suffice to animate his professional exertions for the rest of his life. It is, that all the greatest benefactors of mankind have been either practical agriculturists, or the devoted friends thereof—that they have deemed agriculture not only an *art* but a *science*, to the perfection of which the study of books is indispensable; and moreover, that to the end of time, it will always fall so far short of perfection, as to leave ample room for constant improvement, even to the wisest and most experienced of our profession. To strive therefore with might and main after this improvement, and with a zeal and perseverance proportioned to its importance, should be deemed the indispensable duty of every man who presumes to call himself a friend to the great, the vital cause, of agriculture. All who give it only *lip service* should be ranked amongst its worst enemies, since the tongue alone is worse than nothing, unless the heart, the hand, and the purse, unite in its promotion: nay more, unless this union, in the case of us Virginians, should so work as to obtain legislative aid to our cause. But no man in his senses can hope it, as our legislatures are now constituted, if he judges by their undeviating neglect of agriculture, from the end of our revolutionary war to the present time; although strange to say, a large majority of them have always been agriculturists! Of this there can be but one even *probable* explanation; it is, that they must believe *party politics* to be much more deserving of their patronage than *agriculture*. To cure them of this hallucination there is only one remedy, and *that*, thank God, is still in our power, although there is some doubt whether we shall all be sufficiently alive to our own interest, to apply it. This remedy is, either to elect no more representatives without clear, unequivocal pledges to do something for agriculture, or to instruct all who will not give such pledges, that they *must* do something, or never again expect our suffrages. Why this course has not been pursued, after so many fruitless and deeply mortifying applications to our legislatures, is to me utterly inexplicable, but upon the supposition that the majority of us are stone blind to the obvious means of relief; or that those who *can* see them and are fully aware of all their momentous bearings, want the courage and perseverance to combat that fearful and most formidable obstacle to improvements of every kind, which consists in a union of ignorance and asinine indifference relative to our best interests. We agriculturists *may* and often *do* live so comfortably at home, by industry and frugality, almost in spite of government neglect, nay even of government hostility, that we remain ignorant of the vast extent to which legislative enactments have benefited agriculture in other countries, and might advance our own, if we would only exert over them *that* influence, *that* control, which our constitution has secured to us. Should we much longer neglect to do so, all argument, all persuasion, used for any such purpose, will be as entirely thrown away, as an attempt to show how a dead man's life might have been saved had a certain nostrum been administered while he was alive. Unless we mean "*to give up the ship*," in other words, to abandon our good old mother, Virginia, to her aboriginal inhabitants, the bears and wolves of the forest, and flee to "the far west," we *must* insist upon the establishment at public expense of a board of agriculture, or an agricultural school, or an agricultural survey of the state, or all three together. One or all of these means are indispensably necessary, if we would maintain among our sister states that relative rank and importance to which our soil, climate, natural resources and population, so justly entitle us. * * *

There is another of your improvements which deserves a special notice, on account of the highly important purpose, in a national view, to which it is designed to contribute; I mean the establishment of the silk-culture in the United States. This improvement is the handsome building lately erected for a cocoonery. Like others destined for a similar object, which are now preparing in various parts of our country, this house illustrates the existence of a moral phenomenon, for which no one, I believe, has ever yet been able to account. It is the liability of our minds as well as our bodies to certain untraceable diseases to which the common name of *epidemics* has been given. Such formerly in Holland, was the disease called "*the tulip mania*," which, when at its height, caused single roots to sell from 2,000 to 5,500 guilders; a sum, that in our currency, would exceed two thousand dollars. And such, within our own times, was, "*the merino mania*" in these United States, with another of more recent date, that shall be nameless. From the sheep mania and its successor, I luckily escaped, by using great precaution to keep out of the way. But I plead guilty to a voluntary exposure to what I will take the liberty to call the "*multicaulis fever*"—a disease which threatens to spread vastly more than did the merino mania; because mulberry bushes being far more divisible than sheep, and of course much lower in price, many more persons can afford to buy: add to which a thousand or two per cent. profit, seems to be confidently expected from each mulberry investment, whereas the merino purchasers, I believe, rarely anticipated much more than one or two hundred per cent.

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But to be serious: I verily believe that although this multicaulis business will certainly humbug a multitude of those ever sanguine people who calculate on amassing enormous fortunes by it, yet that it *may* prove highly profitable to all who will be prudent enough to sell at the market price, whatever it may be, immediately they have any trees or cuttings to dispose of. That this price will and inevitably must be much less 12 months hence, I think absolutely certain, notwithstanding all the prophecies you have been flattered with to the contrary. My reasons for this opinion are, that some sellers among us are already asking less per thousand for buds than they did only a few weeks ago, which indicates that the demand is nearly or quite supplied, and that it is notorious; ninety-nine purchasers out of a hundred buy to *sell, and not to feed silk-worms*, which require a much cheaper diet than mulberry bushes at one or at two dollars each. This cheaper food will soon be raised for them by the enormous speculations in that article now raging every where and aggravated to a most dagerous height by the lust of inordinate gain. *Then* but not *until then*, can we rationally expect that the making of silk will become a regular and general business. The fact of its perfect practicablity is now established beyond a doubt by the great profits which many of our northern brethern have derived from it—although but few, compared with our whole population, have yet carried it to much extent. That we should not now see multitudes engaged in it, seems entirely attributable to the multicaulis fever, which has excited the belief that vastly more money can be made by cultivating food for silkworms, than by raising the worms themselves.

Another reason for believing that the manufacturing of silk will become, in a few years, a permanent source of great individual and national wealth, is the enormous present consumption of this article, from foreign countries no better adapted than ours, if as well, to its production. By the report of the Secretary of the Treasury, made to congress on the 8th of May last, it appears that there were imported into the United States during the fiscal year ending on the 30th of September, 1837,

Of manufactures wholly silk	$11,114,179	worth
Of do. silk and worsted mixed	1,810,947	do.
Making the enormous total	$12,925,126	

When we add to this the probable amount of our home manufactures of domestic silk, it will not be an extravagant estimate to say, that the value of silk goods annually consumed in our country is not much, if any short of one dollar per head for every man, woman and child, in the United States!! Some possibly may ascribe this chiefly to fashion; but after making every reasonable allowance for this influence when we reflect that silk is much more lasting than cotton, and better adapted for most articles of wearing apparel, as well as several other things, we cannot for a moment doubt that its consumption will increase in full proportion to the decrease in the cost of its production. This is the natural, the constant effect, whenever the supply of any useful article whatever, either fully equals or a little exceeds the previous demand. More of it will certainly be purchased, because the reduced price brings it within the means of a greater number of consumers: and thus it is, that demand and supply will forever act and react upon each other, when trade is free.

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From the Cultivator.

THE MULBERRY.

We stood alone, among our cotemporaries of the press, for a long time, in maintaining, that the morus multicaulis was too tender to withstand our northern winters. We see our opinion now confirmed by some of the longest established growers, who, if we remember right, once maintained a contrary opinion. And we notice in a late 'Farmer and Gardener,' printed at Baltimore, Md., "directions for preserving the multicaulis through the winter,"—which consists in *taking them from the ground*, and covering them with earth in the cellar. At a late farmers' meeting in Northampton, Dr. Stebbins and Mr. Whitmarsh, who have both, we believe, for a number of years, been actively engaged in propagating and vending the mulberry, pronounced the multicaulis not suitable for our climate. We subjoin quotations from the remarks of each:

"Experience has taught us," says Dr. Stebbins, "that our climate is not congenial to the habits of the morus multicaulis plant; many thousands have been lost every year in consequence of not providing a shelter and protection for them against the frosts of autumn, and the severe cold of our winters. It has been demonstrated to us by expensive experiment, that the tree is not suited to our borean seasons."

"The principal objections to this tree is," remarks Mr. Whitmarsh, "that the leaves contain a great proportion of watery matter, which causes the worms that are fed upon them to be unhealthy, and hence injure their silk. He thought this objection would operate more seriously at the south, where the seasons are longer and warmer. The heat would cause them to grow more rapidly, the leaves would be larger, and he thought, imbibe more moisture. He regretted the universal adoption of this tree at the south, and feared that a failure caused by this fact, would retard the progress of the [silk] business ten years, by discouraging so many who would become losers."

We quote the above as affording hints that may be useful to those who are about embarking in the silk business; though we somewhat doubt if Mr. W. is correct in his objections to the leaves of the multicaulis, and we think he is decidedly in error in supposing that this objection, if well founded, will be greater at the south than in the north; the greater heat at the south decreasing, instead of increasing, the succulence or watery properties of the foliage.

These two gentlemen give a decided preference to what they term the *Alpine*, which Mr. W. says is "the kind universally used in France and Italy." We do not mean to charge these gentlemen with wanton deception, for we have a high opinion of their good standing; yet there is something so mystical in these declarations, so contrary to receive opinions, that we can not pass them as current truths, without asking for some further explanation. We have examined all the botanical and other works in our possession which treat of the mulberry, and they are neither few nor of doubtful authority—and yet we can not find in any one the term *Alpine* given to any species or variety of the mulberry. And as to the assertion that the Alpine is universally used in France and Italy, we have Gen. Tallmadge's declaration, that in Finizio's establishment, in Italy, which he visited, 3,000 lbs. of sewing silk are made a week, mostly from the black mulberry (*M. nigra;*) that Finizio stated to him, that the worm fed on the black mulberry made the strongest thread; that on the white mulberry finer and better fabrics; that on the Chinese (*M. multicaulis*) still finer and more delicate fabrics. And we think, (for we have not the letter at hand,) that Gen. Tallmadge says the white mulberry (*M. alba*) is almost exclusively employed in France. Loudon says, "the M. alba is commonly cultivated in France and other countries, for its leaves, to feed silk-worms, though in some parts of Spain and Persia they are said to prefer the black mulberry." *Enc. Plants*, 792. The Alpine, we presume is a *variety* of the M. alba, and is probably the one alluded to by Loudon, where he says—"the most valuable variety of the M. alba is one grown in Italy, and especially in Lombardy, with vigorous shoots, and much larger leaves than the other." This may also be the Dandolo of Loudon, and the Italian of Sweet, and possibly the Brussa of Asia, from whence it may have been brought to Italy.

Dr. Stebbins advertises the public, that the undernamed (and many not named) descriptions of the mulberry, may be had of him in Northampton, viz. the Manilla multicaulis, the Canton, the *Alpine*, the *Asiatic*, the *Smyrna*, the Brussa and Dandolo. Now we protest against this fabrication of new names, for old things, whether it be from ignorance, for novelty, or to subserve the interests of the trade. Those printed in italics appear to us to be absolutely of new coinage. This unnecessary multiplication of names tends to mystify the business, to deceive the public and to retard a useful branch of national industry. We believe that all which are named in the Doctor's advertisement are merely *varieties* of the white mulberry, differing somewhat in the size of their foliage, and in their hardihood, but very little in their properties for silk.

We have no sort of objection that Doctor S. should puff his own wares, or his own kind of trees—but we do object to his doing it to the prejudice of others, and of truth—which he indirectly does when he remarks—"The Brussa and Dandolo appear to be selected white mulberry—leaf not large—tree hardy, and there are some other varieties, *which may be used for change of food!*" Now if the Docter has seen the cocoons and silk produced *exclusively* from the Brussa, he must know that the insinuation here made, that it is unfit for the *entire* subsistence of the silk-worm, and the production of excellent silk, is neither ingenuous nor true; and if he has not this personal knowledge, he has no right, as an honerable man, to give the intimation imputed to him.

The general impression is, that the M. multicaulis will produce few or no seeds. This is probably owing to its rapid and continued growth of wood—and the tree will probably fruit freely when it has attained to maturity of growth. We have yet none but young trees among us, comparatively; and it is particularly remarked of the mulberry, that young trees are shy in bearing, and that the quantity and size of the fruit increases as the tree advances to maturity.

In the East Indies, according to Loudon, the plants are raised from cuttings, eight or ten of which are planted together in one pit, and the pits are distributed over the field at the distance of two or three feet every way. These cuttings being made firm at the lower ends, soon form stools about the size of a raspberry bush, and from these the leaves are gathered. The stools are cut over once a year to encourage the production of vigorous shoots from the roots.

From the Genesee Farmer.

TREATMENT OF THE HORSE—FOOD.

The horse is one of the most useful animals that has been subjected to the dominion of man, but his treatment in the matter of food is frequently such that his powers are but imperfectly developed, and his value nearly destroyed. With too many his position is that of the slave; devoted to all manner of drudgery, and left to gather a precarious subsistence as best he may. To care for a horse seems, by many, to be considered beneath the *dignity* of the master, when the horse, perhaps, in every respect, is the worthier animal of the two.

There is scarcely any thing that can be used as food upon which the horse will not subsist. Though not precisely carnivorous, and from his structure evidently intended not to subsist on flesh, there are numerous instances in which the horse has attained a relish for meat, and in the language of one of Walter Scott's heroes, "taken his meals like a christiain." Nearly every one has seen the horse lick blood, but this is owing most probably to a liking for the salt it contains. In Bracy Clark's work on the horse, and in the 'Veterinarian,' are several cases of horses eating flesh. One, a colt, was in the habbit of putting his head into a pantry window, and stealing all the cooked beef, mutton, or veal that he could reach; pork, however he rejected. In India, horses are taught to subsist on meat by boiling it to rags and making it into balls with grain and butter, which at first, are forced down his throat. During the long marches of the Pindaree robbers, their horses will make a meal on the boiled sheep's heads, that have been slaughtered for the men. Mr. Melling, in England, had a horse that would eat beef or bacon, in preference to oats or corn, when put into the manger at the same time; and a leg of roasted mutton was his favorite dish. The author of that amusing work 'A trip to the Pictured Rocks of Lake Superior,' gives an account of a horse at the rapids of the St. Mary, which would at any time devour raw fish, and during the winter, subsisted on salted and barrelled white fish from the Superior; and the practice of feeding horses on fish, according to 'Bullock's Travels,' is common in Norway.

Hay and grain are however, the kinds of food on which those who keep horses must mainly rely for their subsistance; and the kinds of these best adapted to the horse, and the quantity required to keep him in good condition, and enable him to perform labor, are inquiries of much interest.

In this country, our hay is principally made from clover and timothy, with a mixture of June grass and red top; the quantity of the two last mainly depending on the soil of the meadow, and the time it has been laid down to grass. Where the system of rotation in cropping is adopted, clover forms a large proportion of the hay, as this grass cuts the largest weight in the shortest time, makes good hay, and is proved to be the best renovator of fertility in soil. Stewart in his 'Stable Economy,' says:—

"In England, clover hay stands in high repute for the hard working draught horse. In the market it brings 20 per cent. more than meadow or rye-grass. Hard upland meadow hay is preferred for hunters or racers, because, I suppose, they are apt to eat too much of the clover. In Scotland, rye-grass hay, or a mixture of rye-grass and clover, is considered the best for 'all horses. The greater part of the hay in Scotland is bad.

Hay differs very much in its quality, not only from the different plants of which it is composed, but from its method of curing, its age, and the manner of its preservation. New hay is not good for the horse. If confined to it without any mixture of oats, he is apt to be purged and consequently debilitated. The horse is fond of it, and will eat a large quantity, but such hay is difficult of digestion, and much of it passes, little altered in its appearance, and propably without having parted with its nutritive properties. On the other hand, hay which is too old, is dry, tasteless, brittle, and has evidently lost much of its value as an article of food. According to Mr. Clark, "good hay is about a year old, long and large, hard, tough, its color inclining to green rather than to white: it has a sweet taste and a pleasant smell; the seed is abundant, (proving it was not cut till nearly ripe;) infused in hot water it produces a rich dark colored tea. The less dust hay has about it the better; but from the soil, and the way in which hay is made here (England) it is seldom free from dust. In damp weather hay absorbs much moisture, and of course weighs a good deal the heavier. The market weight of new hay till the 4th of September is 60 pounds the truss, of old hay 56 pounds.

One of the worst kinds of hay for the horse is that which has been over heated, or, as it is commonly expressed, *mow-burnt*. To cure hay well, it is necessary that it should pass through a sweating or heating process; this developes the saccharine qualities of the grass, and confers upon it addtional nutritive power. This process is the more necessary in curing green hay, and it is usually performed in the cock; (and in clover this curative process can be performed so well in no other way;) while that which stands till its juices are perfected by ripening, requires, and is capable of but a very slight degree of sweating. If this fermentation is arrested at the proper time, and exposure to the air instantly does this, the hay is the better for it; but if carried too far, or if, as too frequently the case, the hay is put into the barn too early, fermentation or heating goes on till the nutritive properties are mostly or entirely dissipated, the hay becomes rotten, black and worhless, or is in the condition that is known as mow burnt. When this kind of hay is fed to horses, thev will select and eat small quanties of it; and if compelled by hunger to eat more, its bad effects will soon be discovered. It is doubtless the worst food a horse can receive; and when purchased, it is probably the dearest. To some horses, such as are employed in fast work, its diuretic qualities render it destructive; good straw is far better than such hay for any animal; but cattle suffer less from mow-burnt hay than horses. *Musty* hay is different in some respects, from mow-burnt hay; as it is more apt to effect the wind, or produce disorders of the lungs; while it is not positively injurious or poisonous in others respects, like the first kind described. It is known by its unpleasant smell, bad color, and odor, and bitter taste. Examination shows such hay to be coated with fungi, or minute mushrooms. The smell of musty hay is most distinct when breathed upon; and a horse after eating a few mouthfuls will sometimes turn from it with disgust. Old hay that has never been heated, if exposed to damp air, will sometimes become musty; and in that state is wretched stuff for any animal.

Mr. Youatt, in the 'Veterinarian,' says very justly,—

"It ought to be understood that food ought to possess bulk in some degree proportioned to the capacity of the digestive organs. Nutriment can be given in a very concentrated form, yet it is improper to condense it beyond a certain point. Corn (grain) alone will give all the nourishment which any horse can need, but he must also have some fodder to give bulk to the corn, though it need not of necessity yield much nutriment."

Let a man who doubts the necessity of feeding his horse or any thing but grain, try living on pemmican, or the concentrated essence of beef, for a while, and he would be glad of a slice of bread, though containing much less positive nourishment: even if the bread was of the coarsest kind ever compounded by Dr. Graham.

The quantity of grain allowed a horse, the quality of the hay, and the labor to be performed, must all be taken into consideration in determining his daily allowance. Baron Bulow, the german agriculturist, estimates the 8 pouuds of good meadow hay, or 7 if made from clover or sainfoin, is equal in nourishment to 3 pounds of oats. Eight pounds of good hay and 15 to 18 pounds of oats, have been proved sufficient for fast work, that is for coach horses who work only one or two hours a day, but while in use go at a great pace. Heavy team horses will consume from twenty to thirty pounds, for the necessity for limiting these as to quantity does not exist. If the work is to be fast, the hay must be limited in the quantity, or he will have a large belly, which is incompatible with fast traveling.

We know of some farmers who keep their horses on hay alone, unless some hard day's work is to be done, when perhaps half bushel of oats is allowed them in the morning. It is not disputed that a horse can live on hay; but if the farmer who treats his horse in this way would properly appreciate the advantage they derive from the oats for that day's labor, he should live on bread and water for a fortnight, and when compelled to perform a seven days labor, indulge his stomach with a slice of ham or steak. A horse kept on hay alone always has a tendency to become feeble and pot-bellied. A little grain, a few roots, or even a mash of bran, if given only once in two days will aid materially in keeping him in good heart and flesh. There is a material difference between a horse that eats to live, and one that eats to work; and it should be remembered that the stomach and bowels will hardly hold sufficient hay to keep even an idle horse alive.

Straw has been of late somewhat extensively used as a substitute for hay; and when cut into chaff, as it always should be, and mixed with the ground or boiled grain it is found to answer every purpose; and the horse will perform his work as well as on hay. If as some have contended, a quart more of oats daily is required where straw is substituted for hay, there is still a saving, where, as in this country, straw is by the farmer considered of no value. In many parts of Europe, wheat, barley or rye straw, forms the whole, or greater part of the dried herbage used as fodder, hay being almost unknown. Here it is little used as food; the use to which it is put, is littering the stable, and for this it is too much neglected. If farmers who keep a stable of horses (and they cannot be dispensed with where wheat is extensively grown) would adòpt the mode of grinding their oats, and using straw made into chaff, for which purpose Green's straw-cutter is most admirable, they would effect a material saving, besides being enabled to keep an additional number of cattle or sheep on the hay now necessary for their horses.

In the United States, barley has never met with much favor as food for the horse. Whether this is owing to the fact that little has been used for that purpose, and consequently the best mode of feeding it is unknown, or whether the climate renders the grain itself unsuitable, does not seem to have been clearly decided. We think the first is the cause; since in Europe it is extensively used for horse-feed, without the least injurious consequences; and the robbers of Arabia, and the Turcoman of Bokkara, use no other grain, or very rarely any other, to feed their fleet and beautiful horses. Pounded and mixed with water, or when it can be had, with milk, the Arabian horse defies fatigue; and with a few pounds of barley meal daily, and the scanty herbage which in a few favored places is found in the desert, he keeps in high condition through the year. While, however, oats can be grown so much more easily than barley in much of our country, the culture of barley for horses will be little attended to by the farmer.

Next to oats, corn is the grain most used for feeding horses in this country; and in some parts, as in the southern states, it is almost the only grain they receive. The excellence of the southern horse generally, his spirit and capability of enduring fatigue, are decided proofs that the unfavorable impressions entertained in England and some other parts of Europe of this grain as horse feed, are entirely without foundation. We have tried oats, corn-meal, and shorts, with cut straw, as food for the horse, and on none of them did he thrive better, have more perfect health, or perform severe labor better, than when fed with the corn-meal and straw. Some precaution is necessary, when changing from oats, or shorts, to corn; as the latter contains far more nutriment than the others, and is more stimulating; and if given in equal quantities is apt to be injurious to the animal. And the same remark is true in regard to barley or wheat.

Neither corn, barley, or wheat, should ever be given to horses without first being ground; and if oats are first submitted to this process, a very great saving is effected. Straw should never be fed to a horse without being cut, and when hay is dry and hard much will be gained by cutting this. Every one is acquainted with the fact that horses fed constantly on unground grain, or dry straw, or hay uncut, will soon have their grinders worn out, or so low as to become unserviceable, and of consequence much of the food swallowed will be unmasticated, and of very little use. The teeth of the horse prove, that by nature dried grain plants were not intended for his sole food, and if we wish to have this useful animal retain his full strength and usefulness, the laws of his construction cannot safely be disregarded.

From the Franklin Farmer.

HIGH PRICED LIVE STOCK.

Henry Clay, Jr. Esq. of Fayette county, sold his cow, Princess, a few days since, to Messrs. John and Richard Allen, of the same county, for $2000.

William P. Curd, Esq. of Fayette county purchased of Mr. John R. Bryant, of the society of Shakers, Pleasant Hill, Mercer county, Ky., a few days ago, a pair of Berkshire hogs, for which he paid $500.

Thomas H. Clay, Esq. purchased at the sale of Mr. Thos. Smith, last week, near Lexington, the improved short horned Durham calf, Grosvenor, two years old, for $700.

Kirkpatrick, formerly the property of Messrs. Offutt & Washington, of Scott county, was purchased at the same time, by Messrs. Williams, Lewis & Viley, for $600.

From the Cultivator.

GREAT RUTA BAGA CROP—MIXING SOILS.

Schaghticoke, (N. Y.) Dec. 1838.

Mr. Buel—Sir—I send you a statement of the produce and culture of a patch of ruta bagas, which I have raised the present season, the profit of which, if not the greatest, I flatter myself, is not the least which will be offered for your premiums, as the summer has not been favorable to the produce of large crops of turnips. The soil is a sandy loam, (generally so called,) but contains by far too great a proportion of sand to be termed good, and I think myself amply compensated for applying from 50 to 100 loads of clay per acre, in the increased products of the first two years. The manure was spread and ploughed in immediately before depositing the seed. They were sown the first day of June, in drills about two feet apart one way, and owing to a partial failure of the seed, which was old, a foot or 18 inches the other, which I am persuaded was an advantage to the crop, as they grew very large; one weighed over 24 lbs. after being trimmed. The after-culture was one dressing of plaster, which I think is of very great advantage to them, especially in a drought; three hoeings or weedings, in which care was taken not to earth them up at all. The harvesting is very much facilitated by using a hoe ground sharp to cut the tops as they stand in the ground, after which they are pulled with a hook; in this way two men will gather seven or eight hundred bushels of them in a day. I had 970 bushels, calculating 70 lbs. per bushel, from 126 rods, at the rate of 1,231 bushels per acre. I had another piece I think equally as good, which were not measured.

The profit of the 126 rods is as follows:

Dr.	To 20 loads manure, at 25 cts -	$5 00
	Carting and spreading the same -	3 00
	Ploughing, rolling and harrowing	2 00
	Seed - - - -	0 37½
	Sowing, ⅓ day - - -	0 25

3 hoeings, 10 days, 6s	7 50
Harvesting, 6 days, 5s	3 75
Interest on land at $100 per acre	5 50
	$27 37½
Cr. By 970 bushels ruta bagas, at 1s. 3*d.*	$151 56
Tops for fodder,	5 00
⅔ds manure for succeeding crops,	5 32
	$161 88
Deduct charges,	27 37½
Balance,	$134 50

Profit $134.50. or $170.80 per acre.

I am trying an experiment in feeding them, which if important, shall be communicated to you and the public. Yours, &c.

JOHN C. MATHER.

CORN CROP.

Volney, Oswego co. Nov. 27, 1838.

Mr. Buel—Sir—I saw in your March number of the Cultivator, a premium offered on several articles of agriculture; I therefore send you a statement of one acre of corn raised by me this season, hoping that if I do not prove a successful competitor, the cause of agriculture may receive an additional witness in its behalf. The soil is a warm gravel; the corn was the twelve-rowed yellow variety. About the 1st of May, I carried on and spread, all over the ground, seventeen loads of stable and barn-yard unfermented manure, ploughed before the manure dried; bushed and harrowed the ground well, being careful not to disturb the sod, which had lain to pasture four years; and on the 14th and 15th of May, planted the same, three feet and three inches apart each way. It was dressed with seven bushels of good unleached house-ashes, mixed with one and a half bushels of plaster, when it made its appearance above ground. On the 10th June, went through between the rows both ways with cultivator; 18th June, cultivator both ways, then thinned to four stalks in each hill, and hoed out the weeds. On the 3d July, cultivator both ways, and commenced hoeing; put no more earth about the hills than we took from them, but carefully cleaned out all the weeds from the hills. The seed was prepared by rolling in tar water and plaster. The corn was cut up the 1st of September, at the ground, and shocked in small shocks, and on the 25th it was husked and housed.

The product is 110 bushels of first-rate corn, and 6 bushels of second-rate, making in all 116 bushels of corn, and four loads of stalks per acre.

Expense of crop.

Ploughing 1 day and board		$2 00
Bushing and harrowing 1 day		2 00
Planting 1½ days		1 13
Hoeing 4 days		3 00
Horse and hand with cultivator 2 days		2 00
Cutting and shocking 2 days		1 50
Husking and housing 8 days		6 00
Ashes and plaster,		1 25
Interest on land at $50 per acre		3 50
Thrashing corn 3 days		2 25
17 loads manure at 25 cents	$4 25	
Carting and spreading	4 25	
	$8 50	
Deduct ⅔ds for succeeding crops	5 66	
		2 84
Total charges		$27 47

Value of crop.

110 bushels sound corn, at 6s. 6d.	$89 37½
6 do. soft corn, at 3s.	2 25
4 loads stalks, at 8s.	4 00
	$95 62½
Deduct charges	27 47
Net profit	$68 15½

WILLIAM INGALL.

I hereby certify that I am personally acquainted with the above named William Ingall, and believe him to be a person of veracity, and that the truth of his statement may be depended on.

AARON G. FISH, *Justice.*

For the Farmers' Register.

ESSAY ON VEGETABLE PHYSIOLOGY.

By GEORGE D. ARMSTRONG, Prof. of Nat. Philosophy and Chemistry, in Washington College, Va.

CHAP. I.

DEFINITION OF VEGETABLE PHYSIOLOGY. ITS IMPORTANCE TO THE FARMER. TYPES AND TYPICAL OR NORMAL FORMS. TYPE OF VEGETABLES. DEPARTURES FROM TYPICAL FORM.

Vegetable Physiology, is that department of natural history, which treats of the structure, and vital action of plants. Some botanists use the term physiology in a more confined sense; as embracing nothing more than a treatise on the vital action of plants, or the laws of vegetable life; assigning an exposition of the structure of plants, to a separate department, viz., vegetable anatomy. It must be confessed, that such a definition is in more strict accordance with the proper meaning of the word physiology, and also in more perfect conformity to the principles of scientific arrangement, than the one which I have adopted; yet, at the same time, it is true, that it is advisable to depart from strict scientific arrangement, where the benefits arising from such a departure more than counterbalance the evils attendant on it. Such, I think is the case, in the present instance. It is impossible to impart information respecting the vital action of plants, without giving at the same time, a more or less extensive exposition of their structure; and it is equally impossible, to give a full exposition of their structure, without speaking, occasionally at least, of their vital action. Besides this, it is so much easier to understand, and remember any peculiarity in the structure of a plant, when we know the end which is to be accomplished by it—or any thing respecting the vital action of a plant, when we know the peculiar mechanism by which it is accomplished—than when we are left in ignorance respecting these matters, that we may doubt, whether a perfect separation of the two subjects, would be desirable, even if it were possible. Indeed, they have never been kept entirely separate, even by those who have adopted the strictest definitions. Understanding the term as defined at the commencement of this article, it is the business of the vegetable physiologist to lay open for inspection, the machinery of vegetable life, and to explain the manner in which that machinery operates; to determine the structure of the different organs of plants, the functions which they severally perform, the manner in which they perform those functions, and all the changes which they undergo, under the influence of climate, seasons, accidents, or the art of man.

"Plants whether regarded as individuals, or as grouped in the garden, the field, and the landscape, are objects of universal interest. The beauty of their forms, the delicacy, harmony, and splendor of their colors, the fragrance which they exhale, the refreshing verdure and convenient shade which they afford, as well as their more important uses, in ministering to our sustenance and comfort, connect our interest, and even our existence with theirs." The opinion, "that whosoever could make two ears of corn, or two blades of grass, to grow upon a spot where only one grew before, would deserve better of mankind, and would do more essential service to his country, than the whole race of mere politicians put together," is a dictate of the soundest philosophy. Plants being of so much importance to man, an examination of their physiology may certainly lay claim to a share of his attention.

The business of cultivating useful plants belongs to the farmer; and I here use the term cultivating in its widest sense, as meaning, causing them to spring from the earth, watching over and assisting their growth, guarding them against disease and injury of every kind, and so far as such a thing is possible, perfecting them for their intended use. The farmer who would perform well his part, has by no means an easy task. There are but few plants, which in their wild state, are suited to answer a very valuable purpose in the economy of life; and there are fewer still, which may not be improved by a judicious system of cultivation; and I may add, none which, after they have been improved, will not degenerate, under an injudicious system of cultivation. This improvement it is the interest of the farmer to effect; and having once effected, to preserve. There is no plant which is not subject to diseases, arising from the operation of external agencies upon the system of the plant itself. From these it is the interest of the farmer to protect them. There is no plant, whose growth may not be assisted by the well-directed, and well applied labor of man. The stalk of corn which has sprung from a grain dropped by accident in the uncultivated field, and thus thrown upon its own resources, and left unbefriended to struggle for existence, with the grass and weeds which surround it, cannot compare. with the well cultivated stalk in the luxuriance of its growth, or in the richness and abundance of its fruit. It is evidently the interest of the farmer, to afford this necessary assistance. Plants have to be refined and civilized, (if I may be allowed to use such an expression,) in order to fit them for the use of refined and civilized man. To the farmer, the business of effecting this, belongs; and he can know but little of the difficulty of this task, who supposes that it can be well performed without the exercise of sound judgment, and the possession of an extensive acquaintance with the nature of those things, on which, and with which, he has to operate. Such being the case, we may assert, without fear of contradiction, that the principles of vegetable physiology, must enter into the very foundation of every correct and intelligible system of agriculture.

Vegetable physiology has never received from farmers, that degree of attention which it has deserved. It is true, that with many of the facts connected with this subject, farmers have long been familiar; but the general principles, and, in fact, all that constitutes its claim to a rank among the sciences, have received but little attention. This is, no doubt, to be attributed principally, to the want of some work which would present the subject in an intelligible and concise manner, and divested as far as possible, of technical phraseology. Those who have hitherto written on this subject, have generally been naturalists, perfectly familiar with the extensive latin terminology of systematic botany, and who, forgetting that the majority of those who would be, or who ought to be their readers, were not equally familiar with this language, have introduced so much of it in their works, as to make them, to the common reader, "sealed books." Besides this, most of the works which have been written on vegetable physiology, have been written professedly as introductions to systematic botany, and on this account, an extended explanation of technical terms, as well as much other matter entirely irrelevant to the subject, has been introduced. The object of the present series of essays, is to remove this difficulty (as far as the author may be able), by presenting the principles of the science in popular language; or if in any instance it may seem advisable, either for the sake of brevity or exactness, to introduce a technical term, by adding a definition at the time the term is used.

There is one consideration recommending to the farmer the study of vegetable physiology, which is not true to the same extent, of any other department of natural science at all connected with agriculture. And that is, that no complicated apparatus, or extensive acquaintance with the mathematics, is requisite, to enable a person successfully to pursue his investigations on this subject. Whatever we may learn respecting the physiology of plants, we must learn, by observing their operations as carried on around us, or by experiments so simple, that any person of common ingenuity can perform them; and any person of common intelligence can understand them. For pursuing investigations in chemistry, expensive apparatus and materials are necessary; in natural philosophy, an extensive acquaintance with the mathematics is indispensable; in geology an examination of different countries, and different parts of those countries, or at least of extensive geological cabinets, such as are accessible to few, is essential. But for investigations in vegetable physiology, we have the subjects of examination, and the materials for experimenting, at all times, and everywhere, at hand. All that is necessary to enable a person successfully to prosecute inquiries respecting this subject, is, an acquaintance with that which is already known; habits of close and accurate observation of nature, ingenuity, and patience. If he possess these, his labors cannot fail to be crowned with success.

With these brief introductory remarks, we will now turn to the subject before us; viz. vegetable physiology, or an examination into the nature, structure, and vital action of plants. It is difficult, if not impossible, to give a strictly scientific definition of the term, plant. The division of natural objects into the three great classes, of minerals, vegetables, and animals, is one, founded upon an observation of those of their properties, which produce the most lively impressions upon our senses; and not upon an intimate and accurate acquaintance with all that belongs to them. There are certain great and striking diferences, in the structure of the more common, and more perfectly formed objects, belonging to these several classes, which we all observe. A mineral remains fixed to the same spot, and undergoes little or no change, in the ordinary course of things. A plant is continually undergoing changes; it springs from the earth, puts forth leaves, flowers, and fruit, and finally disappears, and, in due time, is succeeded by others like itself. An animal, not only lives and grows, but breathes, moves, utters sounds, and, in a thousand ways, gives evidence of the possession of a kind of life, different from that which belongs to vegetables. Upon an observation of such differences as these, the general classification of natural objects is founded.

When we turn our attention to the less perfectly formed individuals belonging to these several classes, this broad line of distinction entirely disappears; and so impossible is it to run a dividing line between vegetables and animals on the one hand, or vegetables and minerals on the other, that some naturalists, among whom we must reckon the celebrated Buffon, have contended that there is no exact boundary between them; but that at their extremities, the three great classes of natural bodies melt imperceptibly into each other. Naturalists have frequently attempted to draw the line of separation; but, hitherto, have always failed. Linnæus, distinguished them as follows: "Minerals grow—vegetables grow and live—animals grow, live and perceive." To say nothing of the unphilosophical manner in which the terms grow, and live, are used in these definitions—meaning one thing in one place, and entirely different thing in another—the insufficiency of this distinction will be apparent, if we inquire, how does an oyster manifest its perception? Only by closing its shell when touched. The sensitive plant might lay claim to this power, on grounds almost equally good. Touch it, and immediately its leaves close, and, together with its branches, droop to the earth, as if in this way to avoid further injury. The mention of a single fact, will, perhaps, set this matter before us in a stronger light. The natural order of beings, called zoophites, or animated plants, as their name imports, (of which order the coral may be mentioned, as a familiar example,) were by Woodward and Beaumont, arranged with minerals; by Ray and Lister, with vegetables; and are now, by the common consent of naturalists, admitted to a place among animals. So strongly do they, in some respects, resemble animals—so clearly do they possess many of the traits of the vegetable race—and yet, at the same time, so strange an admixture of the mineral character is discoverable in them, that those who are best acqainted with them, will be least disposed to wonder at these errors.

This gradual melting into each other, which is observable in the three great classes of natural objects, may be noticed in their sub-divisions also. The leather-winged bat, is a connecting link between beasts and birds; lizards, between beasts and reptiles; reptiles themselves, between beasts and fishes. So among vegetables. Ferns and mosses, whose seeds are evident, serve as a connecting link between the more perfect plants, and the numerous classes of lichens and fungi, the most imperfect of vegetables. So also among minerals. The numerous specimens which assume a regular form by cleavage, serve to connect those which appear as rude and shapeless masses, with those which are presented to us possessed of the high polish, and all the beautiful regularity of form which characterize the perfect crystal. In truth, we glide so smoothly, and by such imperceptible degrees, from the rock, or from the tree of the forest, through all the intervening gradations, till at last we come to intellectual man, that we discover no interval between species of beings. An uninterrupted chain connects the two extremes.

The same is true of the different parts or organs of animals and plants. From the perfect hand, that "organ of organs," as it has been termed, in view of its wonderful mechanism and admirable adaptation to the wants of men—we pass by such insensible degrees to the hard undivided hoof of the horse, that it is almost impossible to tell where one variety ends, or where the variety next below it begins. The same remarks will be found to apply with equal truth to the organs of plants. For this reason, naturalists in treating of different classes and organs of bodies, do not attempt to draw lines of distinction between them; but selecting some one individual from among the most perfect of the class to which it belongs, confine their descriptions entirely to it. The one thus selected, is called the *type*; and its form the *typical* or *normal* form of the class. After the description of the type is finished, any variations which other individuals may present, are noticed if it be thought necessary. By adopting this method, that endless controversy about terms, in which the earlier naturalists spent so much of their time, to no purpose, is avoided. As the terms type, and typical, or normal, will, of necessity, frequently occur in the following essays, it will be well for the reader to recollect their meaning.

The common garden bean, (*vicia faba*,) inasmuch as it presents every organ commonly met with in plants, may be assumed as the type of this class of things. If we examine it, we will find that it consists of the following parts: First, an irregularly divided part, in its natural situation buried in the ground, and called the *root*. Second, a green stalk or axis, to which all the other parts are attached, called the *stem*. Third, certain flat, green organs, situated at different distances along the stem, called *leaves*. These are termed organs of vegetation, because their office is, to minister to the nourishment and growth of the plant. From the point at which some of the upper leaves are joined to the stem, spring slender stalks, bearing the flowers. The flower consists, first, of a short, five-notched green bell; this is called the *calyx*. Second, four white or pink leaves, different in form, and far more delicate in texture than the common leaves of the plant: these form, what is commonly called, the flower; in botany, they are termed *petals*, and taken collectively, form what is termed, the *corolla*. Third, ten slender thread-like organs, united throughout the greater part of their length, into two sets, one set containing nine, and the other but one; these are termed *stamens*. Fourth, at the very centre of the flower, are several small green stem-like organs, growing from the end of the young pod; these are termed *pistils*. The calyx, corolla, stamens and pistils, are called organs of fructification, because they are principally concerned in the production of the fruit.

Such is the common garden bean; and such are the organs of which all the most perfectly formed plants are composed. Lowly a species as it is, it comprehends every part employed by nature in the formation of the loftiest tree of the forest. The vast superiority in size which a tree possesses over a bean, is caused by nothing more than an endless multiplication of similar parts, constructed always upon a similar plan, adjusted to each other in the same admirable manner, and all working together in the same perfect harmony and order. The bean lives but for a summer; the oak, on the other hand, lives from year to year, and from age to age. This difference, however, is not owing to any material difference in the structure of the two species; but to a specific power of prolonging its life, inherent in trees, which plants, such as the bean, are destitute of. To get a clearer idea of the manner in which this difference in size is produced, let us suppose a bean during its summer's growth, to produce a stem with ten leaves; and that this stem is hard and perennial, instead of soft and annual. As all perennial plants form a bud at the base of each of their leaves, and as each bud is in fact a rudimentary branch, during the second year of its growth the bean may develope ten branches, and, in this way, multiply its dimensions ten times. During the third year, the same operation may take place, and the consequence of this will be, an augmentation equal to one hundred times its original dimensions; and thus it may go on increasing in geometric ratio. At this rate, a bean would soon develope into an enormous tree; and although that species never does thus change its nature, yet it is true, that every tree, during the first year of its growth, is formed upon a plan analogous to that of the bean, and never more complicated; and that its subsequent growth into a giant of the forest, takes place, upon the plan which has just been described, in a supposed case.

When we assume the common garden bean as the type of vegetables, we ascribe all the differences which exist between it and other plants, to the absence, alteration, or else multiplication, of its several parts. In assuming so important a type as that of the whole class of vegetables, it is proper that we should notice some of the more common variations in form, which other plants present. In the bean, the root is easily distinguished from the stem; and is of nearly the same size with it. Such is the fact with respect to most plants; some, however, present great variations from this, the typical form. In the relative size of the root and stem, the lucern clover (*medicago sativa*) may be mentioned as an instance; with a stem not more than six inches in length, it will sometimes have a root thirty feet long; *i. e.* sixty times as long as the stem. On the other hand, the dodder or love-vine, as it is sometimes called, (*Cuscuta Americana*) a bright yellow, leafless vine, to be found in meadows during the summer, twining around other plants, has no roots at all, except in the early part of its growth. So independent is it of all nourishment derived immediately from the ground, that if a handful of it be torn loose, and thrown upon a tree, it will almost always grow. Perhaps the most curious departure from the typical form (so far as the root is concerned,) is that presented by some species of lichens. These appear like irregular, leafy expansions, laying flat upon the ground, or more commonly upon the surface of rocks. Instead of having any regular root, the whole lower surface of the leaf acts the part of a root, absorbing nourishment for the plant from the ground. One of these species, common on the plains of South America, grows very rapidly during a rainy season, and will sometimes spread itself over a space of a square foot. When the sun comes out, drying the atmosphere as well as the plant itself, it breaks into many pieces, each piece rolling up, with its lower side outwards. In this condition, having no roots to attach it to the soil, it is blown about, the sport of every blast. But, no sooner does it commence raining again, than these pieces unroll, and spreading themselves flat upon the ground, again commence growing; each separate piece giving rise to a new plant.

The common garden bean has a strong, well-proportioned stem, standing erect, and sustaining, by its own strength, its leaves and fruit. The pole bean, a species of the same plant, has a long, slender, twining stem, unable, without assistance, to support even its own weight; much less that of its leaves and fruit. In the bean, the stem is easily distinguishable from the leaves; differing from them in form, texture, &c. In the prickly pear, (*cactus opuntia*,) on the other hand, there is no distinct stem or leaves; the whole plant having the appearance of a series of thick, succulent leaves, one growing out from the end of another. There is a South American species of cactus, frequently cultivated in green-houses, which rises into the air, like a naked green club, bearing neither leaves, nor any thing like leaves. The dodder, also, may be mentioned, as a plant entirely destitute of leaves. The leaves of the bean are green; those of the Indian pipe, (*monotropa uniflora*,) as well as all the other parts of the plant, are perfectly white; and what is not a little remarkable, turn black, wherever injured. Mushrooms have a regular stem, but no distinct leaves, flowers, or fruit. The species of fungus, commonly called puff ball, (*bovista nigrescens*,) is nothing more than a ball of vegetable matter; having neither root, stem, leaves, flowers, nor fruit distinct from each other, but all amalgamated in one common mass. Such are some of the departures from their typical form, which different plants present. A more full account of them will be given, when we come to examine the several organs of plants in detail.

Chap. II.

ELEMENTARY STRUCTURES OF PLANTS. VEGETABLE MEMBRANE AND FIBRE. ELEMENTARY ORGANS OF PLANTS. CELLULAR, WOODY, AND VASCULAR TISSUES.

If we examine a common plant, we find it made up of roots, stems, leaves and flowers, or fruit. These we term compound organs. If we examine one of these, the stem for instance, we find that it is not a homogeneous mass, composed, like a rock, of similar particles cohering together; but that it consists of certain organized parts, in the form of cellules and tubes. These we term elementary organs, organic elements, or, taken collectively, elementary tissues. The sides of these cellules and tubes contain vegetable matter, in what is believed to be its simplest condition of organization. In this condition, it forms what are termed the elementary structures of plants. Should we commence what might be called a mechanical analysis of a plant, we would first arrive at its compound organs; on analyzing these, at its elementary organs, or organic elements; and lastly, on analyzing these, at its elementary structures. It will be necessary that we preserve some order in our examination into the structure and vital action of plants; and I do not know that we can select any better than the one thus indicated; commencing with the elementary structures, then taking the elementary organs, and, last of all, the compound organs of plants.

The elementary structures are but two; viz. membrane and fibre. Vegetable membrane, when examined with powerful microscopes, presents the appearance of an exquisitely thin, transparent, colorless film. In the living plant, it resists the action of water and watery solutions; but when life ceases, it is quickly acted upon by them, and reduced to a pulpy mass. Du Hamel, a botanist of just celebrity, supposes that vegetable membrane is composed of small organic fibres, arranged parallel to each other, and united by a glutinous substance. The fact that it tears with a ragged edge, as has been shown by Prof. Lindley, seems to favor this supposition. Yet as a matter of fact, no such structure can be detected by the microscope; no traces of lines or nettings, or any thing of the kind. On the contrary, it appears perfectly homogeneous in its structure, resembling a simple pellicle, or the film of a soap-bubble. In its simplest form, it composes the sides of the cellules of cellular tissue; a little more condensed, the sides of the sap-vessels; and still more condensed, the general covering or outer skin of the bark. From the nature of vegetable membrane, perhaps some may conclude, that it is not permeable to fluids; but such is not the fact. During the life of a plant, both liquids and gases are passed through it continually; as we shall see when we come to examine into the circulation of vegetable fluids. Indeed, the film of a soap-bubble, to which vegetable membrane was compared, although in ordinary circumstances, it resists the passage of a gas—yet nothing is more easy than to cause a gas to pass through it with great rapidity; and this too, without tearing it, or injuring it in the least.

The second of the elementary structures of vegetables, is fibre. Vegetable fibre presents the appearance of an exceedingly fine thread, resembling the thread of which a spider's web is formed. Any one who may have a curiosity to see it, can have that curiosity gratified, by taking a leaf-stalk of a strawberry (*Fragraria Virginiana*) or what is still better, of a common plantain (*plantago lanceolata*) and having broken it across, carefully separating the two parts. The vegetable fibres, which are coiled along the inside of the spiral vessels of those plants, will uncoil in great numbers, stretching like delicate threads, from one piece to the other. Vegetable fibre does not enter as largely into the structure of the elementary organs of plants, as membrane. The principal parts composed of it, are, what are termed spiral vessels. These are either formed of it twisted in a spiral manner, so as to form a tube, or else have it coiled along their inner surfaces. It is not impossible, that both membrane and fibre, are composed of a still more elementary structure. If we adopt the notion of Du Hamel respecting the composition of membrane, this would seem very probable. Nothing more would be necessary, than to give to these constituent fibres, an arrangement somewhat different; placing them end to end, instead of side by side; and vegetable fibre would be more easily formed from them, than membrane itself. Still this must be looked upon as nothing more than a mere speculation; the microscope reveals to us distinctly, the existence of membrane and fibre; but beyond this it does not go.

Pursuing our inquiry into the structure of plants, the parts which stand next in simplicity to the elementary structures, are what are termed elementary organs. These appear in three different forms, viz., cellular, woody, and vascular tissues. To these we will attend in the order in which they have been mentioned.

The cellular, or as some botanists term it, the vesicular tissue, is the most abundant of the three. If a transverse section of the elder (*sambucus canadensis*) be examined with a good microscope, it will present the appearance of a fine honeycomb, made up of little hexagonal cells. If a part of the same pith be boiled in water containing a small portion of potassa in solution, it may be separated into exceedingly minute bladders, by rubbing it between the fingers. It was these bladders, which, having been cut through, presented the honey-comb appearance noticed in the first instance. In their natural state, they adhere firmly to each other; but being boiled in a weak solution of potassa, their adhesion is destroyed, and they are set free. The pulp of the strawberry consists of similar cellules; and in this instance they adhere so loosely, as to be separated by simply rubbing the pulp under water. The cellules in the pith of the elder are empty, those in the pulp of a strawberry, are filled with a sweet red liquid. The cellular tissue is made up of these cellules, or little bladders, adhering together.

In size they vary much in different plants, and even in different parts of the same plant. Their most common size is from $\frac{1}{400}$th to $\frac{1}{800}$th of an inch in diameter. From this they vary, so as to measure in some instances $\frac{1}{30}$th, and in others not more than $\frac{1}{1000}$th of an inch in diameter. In general, they are smallest in the leaves, larger in the stem, and largest in the roots of the same plant; and larger in succulent and annual plants, than in trees and shrubs. It has been calculated, that a large gourd contains 47,000,000,000,000 of them; a number so great, that it is difficult for the mind to form a distinct idea of it without something to compare it with. Prof. Lindley illustrates in this way. If all the cellules of such a gourd were arranged in a line, and two hundred of them stretched an inch, which is about their size, they would extend about nine hundred miles. The cellules of the gourd are larger than those of most plants. In some plants, and in some parts of plants they are only $\frac{1}{1000}$th of an inch in diameter. Of these it would take a million to cover a square inch of surface; and of course a million million to form a mass measuring one cubic inch.

The cellules of the cellular tissue present a great variety of forms. Of these, the sphere is assumed as the typical or normal form. The most common, modified, or secondary forms, are, the eliptic and oblate spheres, disk, and six and twelve-sided prisms. The typical form is that which the cellules most frequently present. The next most common, is that of a twelve-sided prism, produced by the moderate pressure of six surrounding cells upon one. When the pressure of the six surrounding cells is considerable, in consequence of each cell being distended to the utmost by the liquid which it contains, and at the same time, confined within narrow limits, the form of the prism is necessarily hexagonal. A very pretty illustration of the action of these same causes in producing a similar effect, is afforded by blowing a number of soap-bubbles within a limited space; for instance, in the bottom of a tumbler; each of these bubbles will be found to be a perfect hexagon. If whilst the latteral pressure is considerable, the upward and downward pressures are but slight; a compression of the sides of the cellules will take place, and at the same time, an extension of their ends. In this way, an eliptic sphere, or even a cylinder, may be produced. This is, in fact, very frequently the case. Plants enlarge much more rapidly in a vertical, than in a lateral direction; and, as the consequence, it is found that the cellules very frequently have more or less of the form last mentioned. If the pressure is very great on two opposite sides, whilst it is slight in every other direction, an oblate spheroid, or a disk, will be produced. If the pressure is great in every direction, but particularly great on two opposite sides, the cellules assume the form of their parallellograms. Thus the form of the cellule is determined by the circumstances and situation in which it is produced.

There is a common and very important modification of cellular tissue, to which the name of dotted ducts, or canals, has been given. These ducts are formed of series of short cylindric or prismatic cells, placed end to end, so as to form slender columns, extending the whole length of the plant, in which they occur. During the early part of the life of a plant, these cylinders are entire, and, consequently, each column is composed of a vast number of closed cavities; but, after a time, the ends of the cylinders are torn open, and the cavities communicate with each other, so as to form a tube. At the places where the cylinders join, oblique dotted lines are seen externally, and hence this class of organs have received the name of dotted ducts. Cellular tissue is generally formed of vegetable membrane; and membrane of an exceedingly fine and transparent character. The membrane which forms the cellules of the pulp of a strawberry, is so transparent, that the red liquid which these cellules contain, appears of almost as bright a red as it would if nothing were interposed between it and the eye. The same remark, will apply to the cellules of a common green leaf; for in no instance does the coloring matter reside in the sides of the cellules, or in the membrane of which they are composed, but always in the liquid which they contain. This membrane, however, is not always of so thin and transparent a character. In the hard shell of the stones of fruit, it is so thick that the very cavities of the cells are all filled up with it. Vegetable fibre, sometimes, though rarely, enters into the composition of cellules. When it does thus enter, the cellules are usually composed of one long fibre each, coiled up so as to form their sides; and not of several, crossed or interlaced.

Such is the cellular tissue. It enters into the composition of almost every part of the vegetable structure; it constitutes exclusively the pith; enters largely into the structure of the leaves, sepals, petals, stamens, pistils and seed; and is altogether absent only from the plates of pure woody matter of the stem, and from what are commonly called the veins of the leaves, which are in reality parts of the woody system. Sea-weeds, lichens, mushrooms, mosses and ferns, are entirely composed of it; and are therefore termed cellular plants. This tissue is supposed, to be capable, by itself, of performing all the more important functions of vegetable life; indeed, it must be, inasmuch as the class of plants just mentioned, live, grow, and multiply themselves, without possessing any other. When combined with the other tissues, it has certain objects in particular for which it is destined. One of the most important of its functions, is to absorb moisture, and gaseous matter from the earth and atmosphere; and after effecting a separation of such portions as are suitable to the nourishment of the plant, to give off those portions which are unsuitable. If a slice of elder pith, (which is, as I have already remarked, composed entirely of cellular tissue,) be placed upon the side of a watch-glass containing water, and be allowed to communicate, by ever so small a space, with that water, the whole mass will speedily become saturated; and, on the other hand, it will as speedily part with its water, if exposed to a dry atmosphere. Possessing, in so high a degree as it does, the power of absorbing and giving out fluids, it is well adapted to the transmission of the fluids of plants, from place to place. When composed of cellules of a spheroidal shape, it can allow fluids to pass indifferently in whatever direction a higher propelling force may exert itself. When the cellules have any other figure, they will conduct the fluids most rapidly in the direction of their greatest diameter. In the pith, the cellules are of a spheroidal shape, and conduct the sap to whatever part of the adjacent tissues most need it; in the medullary rays, (those lines apparently of hard woody matter which may be noticed in a gross section of the trunk of a tree, extending from the bark to the centre,) on the other hand, the cellules of which are thin parallellograms, with their principal axes directed from the bark to the pith, the sap is conveyed in a horizontal direction, only. Besides, absorbing, giving off and transmitting the fluids of plants, the cellular tissue is the principal instrument in their elaboration; that is, in the conversion of the crude sap into the sugary, resinous, oily, acid and saline vegetable secretions.

The next in order, of the elementary organs of plants, is the woody tissue. This consists of slender, tough tubes, tapering to sharp points at each extremity. These little tubes are so placed, as that the end of one overlaps that of another; and in this way they form long fibres, running lengthwise through the plant. The fibres of hemp, *(connabis sativa,)* or flax, *(linum usitalissimum,)* may be selected as good specimens of woody tissue. If we examine, with a good microscope, the finest filament of flax, we will find that it is not a simple fibre, but is made up of numerous fibres of different lengths, very closely joined together, and overlapping each other by their slender extremities. By continued maceration in water, or by boiling in very dilute nitric acid, their cohesion may be destroyed, so that by careful management, the simple vessels may be obtained in a separate state. In hemp, their diameter is about six times less than that of a common sized human hair; in many plants, however, it is somewhat larger than this. These vessels, as has been mentioned, are hollow tubes. For a long time, they were believed to be solid; but more careful examination has shown that, in this particular, the early botanists were in error. The great use of the woody fibre, is, to protect the more delicate organs, and to give strength to every part of the vegetable structure. It may be considered the bony system of plants. If it were not for it, the stem of an oak would be as brittle as that of a mushroom; but lying as it does across the cellular tissue, it binds it together, and renders all the parts tough, by its own elasticity and strength.

It occurs in what is commonly called the wood of the plants of which it forms the principal part; in the bark, in small quantities; in the veins of the leaves, and in the husk of most fruits. It appears highly probable, that in addition to the uses just mentioned, woody fibre has the office of conveying fluids in certain directions. The fact that the extremities of its tubes are closed, instead of forbidding, favors such an idea, as we shall hereafter see. It is true, that from the impossibility of observing the progress of fluids, in parts so minute and so easily injured as the vegetable tissues, no one has been able to demonstrate this by direct observation. Yet we can hardly doubt that such is the case, when we consider how rapidly the sap flows up the stem of a tree, which consists to a very large extent of woody fibre; and further, that when colored infusions are made to enter plants, they are uniformly found to pervade the parts composed almost entirely of woody fibre. We may draw an argument to support the same notion, from the structure of the woody tissue. Its structure is such as fits it for this office; and so universally do we observe in nature an adaptation of means to their ends, of structures to their offices, that we may, with very little danger of error, infer the one from the other. An instance of such an inference, which will, perhaps, show the value of such reasoning as this, better than any general remarks, is afforded in the discovery of the circulation of the blood of animals. Before the time of Harvey, the blood was believed to remain stationary in the veins. Harvey had become acqainted with the nature of pumps and the structure of valves—when carefully dissecting a human body, he noticed that there were valves, placed at certain points along the principal arteries. The only use of valves, is to prevent the return of fluids after they have been forced out of their most natural position; or in other words, valves are of use only in connexion with circulating fluids. From the existence of valves in the arteries, he inferred that the fluid which those arteries contained, must circulate through them; from the structure of those vessels, he inferred their office, and subsequent observation and experiment have fully established the correctness of his inference. On similar ground we infer, that the fluids of plants circulate through the woody tissue; although we have never been able, by direct observation or experiment, to prove that they do. In fact, all the elementary organs of plants are so simple in their nature, and so much resemble each other in their structure, that it is not at all improbable, that one organ sometimes performs the work which more properly belongs to another.

The third and last of the elementary organs of plants, are the vessels of the vascular tissue. These are principally of two kinds: first, spiral vessels, and second, ducts. A spiral vessel is composed, either of vegetable fibre coiled in the form of a wire-spring, and with the edges of its contiguous coils adhering together, so as to form an unbroken tube; or else, partly of membrane and partly of fibre; the tube itself being formed of membrane, and the fibre coiled along its inner surface, so as to give it elasticity and strength. It is easy to get a sight of this fibre, in the way mentioned when treating of vegetable fibre; but in this way, we can obtain no correct idea of the structure of the spiral vessels. By carefully dissecting a boiled stem of asparagus, we can examine them, in their natural condition. Spiral vessels are found in plants during every period of their growth; even in the plantule, or embrio in the seed. They stretch through the whole length of a plant, from the root, to the extremity of the leaves. They are generally disposed in bundles, along with ducts and woody fibre; each bundle containing from three, to one hundred. In succulent plants they are found in every part of the stem; in woody plants, they always surround the pith, and form a part of the mid-rib of the leaves; they are also found in the different parts of the flower and seed. In diameter, they vary from three, to one-thousandth of an inch. In flowerless plants, such as mushrooms, lichens, &c., they are entirely wanting; from this it is inferred, that they are connected in some unexplained way, with the production of flowers and regular seed.

If a stem be cut across under water, air bubbles immediately form at the months of the spiral vessels; hence it is inferred that their peculiar office is that of transmitting gases through plants. Some botanists speak of them as the *tracheæ*, or wind-pipes of plants. When we call to mind how large a portion of every vegetable structure is composed of oxygen and hydrogen, and also how large a portion of the carbon of plants is obtained immediately from the atmosphere, we will not be surprised that a class of vessels is set apart for the conveyance of gases. Their structure is admirably adapted to their office. Had they been formed of membrane, only, and placed in the midst of bundles of vessels always distended by the liquids which they contain, they must have been so pressed in on every side, as to have been unfitted for the performance of their appropriate duties. But having a tough and elastic fibre coiled along their inner surfaces, they are enabled to resist this pressure, and to furnish a free passage for gases throughout the whole plant.

Ducts, are membranous tubes, very much resembling spiral vessels in their form, and distinguishable from them principally by their want of elasticity, and the absence of a spiral fibre along their inner surface. The rounded cellules and cylindric tubes, of which the vegetable structure consists, cannot be applied to each other in masses, so as to fit exactly; little irregular spaces will necessarily be left between them. These spaces are termed intercellular spaces. They are usually triangular; but their form will of course be determined by the number of vessels by which they are formed. It sometimes happens, that the peculiar secretions, or products of plants, are deposited in these spaces, and pressing upon the neighboring cellules, form cavities of very considerable size. Of this nature are the turpentine cells, in the bark of the pine.

Such are the elementary organs of plants, and such, so far as is known, their offices. The influence of the vital principle, is beautifully displayed in the action of these organs. The vessels of the living plant, swollen with fluids, retain during life, their figure—change the fluids which they contain into others of the most opposite qualities—and constitute, during life, a sufficient barrier, to prevent them from mingling together. But no sooner is life extinct, than the sides of these vessels yield, the secretions mingle, and in a short time, confusion and decay reign, where, for ages, the vital principle had maintained every thing in the most perfect harmony and order.

[*To be continued.*]

For the Farmers' Register.

STATEMENT OF THE CULTIVATION AND PRODUCT OF A FIELD OF CORN.

Cambridge, Dec. 29, 1838.

Dear Sir—You requested the *result* of a corn crop which I made this year, and my *mode* of cultivation, with its *rationalia*. Though not original, because the *principles* on which it was made are well known and settled, yet it was unusual, and I have not, elsewhere, known their application in the same manner, in *all respects*.

I have, for several years, tried a few acres, under a similar culture; and finding it considerably superior, in all seasons, to the ordinary methods, I extended it this year, to forty acres; and though the drought has very much curtailed the product below the promise of the luxuriant *stalks*, yet, it is very respectable for *field*-culture.

The field in question was cultivated the previous year in corn, in the ordinary mode, having been, the same year, *manured*—about thirty loads, and *limed*, one hundred bushels to the acre. The then ensuing winter and spring, as early as possible, it was ploughed, a moderate depth, about four inches, drag-harrowed and rolled, and drill-planted, in lines four and a half feet apart, and twelve inches in the line; single stalks only left in the thinning, which operation was performed by a patent drill-machine, invented by Francis H. Smith, of Baltimore, which I have found useful, in many years' experience. With one man and two horses, this machine will furrow, drop, cover, and roll down eight or ten acres per day, and, with nearly a mathematical precision, in point of *line* and *distance*. The corn, when up, was worked with ordinary "cultivators," succeeded by one dressing with the "*scarifier*," about six inches deep. This latter implement, which I purchased several years ago, of Sinclair & Moore of Baltimore, has, in my opinion, no *equivalent* substitute, in the culture of our corn-crop; as by it, the earth may be penetrated and pulverized six or eight inches deep, with two horses, and without turning up the sward, and exposing it to the drying action of the sun and air. The cultivators, or any other harrows, (I prefer the cultivator,) are again used and continued, unceasingly, till the sward is rotten, which will generally be about the last of June, when the plough is, for the first time since the planting, introduced to turn up the sward, which, having been so long buried and undisturbed, except by the cutting of the "scarifier,"—and, under the cumulative agency of heat and moisture, is now fully decomposed, and thus incorporated with the soil, which is thereby improved, and adapted to the subsequent wheat or other small grain, which may delight in dainty and well cooked food, when the corn had flourished upon the vapors and gases of the preparatory process. After the *plough*, I take up again, the "cultivator," or any other harrow, under the classic precept, "*multum adeo, rastris glebas qui frangit inertes.*" And the drier the season, the more I use it, to promote the absorption of atmospheric moisture, which, at night, and in the driest season, is more abundant than generally supposed; as well as to assist, by lightening the *surface* soil, the *transpiration* through it, of the waters of the *sub*-soil, which being more forcibly acted upon by the greater permeability of the earth, in this loose, porous, and lightened condition, to the rays of heat, afford a considerable resource of humidity.

You have then my mode of culture, and the principles on which it is founded. I never *cross-plough*, even in ordinary wide planting, *until the sward is rotten. Because*, by this process it is turned up, and exposed to the drying and evaporating influence of the sun and air, by which even *animal* substances, more putrescent than *vegetable*, may be, and are effectually preserved from putrefaction, as in the ordinary practice of curing, as it is termed, fish, beef, &c. &c. *Because*, I have a finer culture, and the soil is better pulverized without it; and though not a thorough-going advocate of the doctrine of the well known Tull, "that pulverization, is, *in itself*, sufficient," yet, I hold it an essential co-operative, and without which, the best crop cannot be produced. And, *because*, by the operation of early cross-ploughing, unless under a deeper furrow than my experience will justify, the sward is exposed, before decomposition, to the antiseptic agencies which I have named, and becomes indurated; and, if it can then be subdued at all, it will require much cost and labor; and will, when done, have lost much of its *pabular* constituents.

In consequence of a *sweep-stake*, which I have taken, upon the crop alluded to—though conceded, and paid over to me, without measurement—yet, I held it proper, unrequested, to have a subsequent measurement and ascertainment, as accurate as possible, of the product, which I will annex.

The remarkable uniformity of the crop, and the hazard, and inconvenience of shelling the whole, so long before a future market, probably of next summer, led me to the following method, viz: "to measure one acre; to have its product carefully ascertained; and to obtain a certificate from a disinterested, judicious, and extensively known character," of the *uniformity* of the growth.

For the latter fact, I wrote to Adam Waldie, Esq., of Philadelphia, who had recently seen the field in its full growth; and because his well merited eminence, as an editor and publisher of literary and scientific journals, of extensive circulation, would give additional currency and strength to the fact; and he politely favored me with the following reply.

"I well remember the pleasant ride I had with you, through your corn-field. It really required ocular evidence to produce a conviction of the growth of such magnificent corn, in such an unfavorable season. I am really desirous to know the result; to know which, the correct measurement of one acre, I should think sufficient for all practical purposes; for, the difference must have been too small to notice."

The following certificate of the measurement of one acre, was then made by myself with affidavit.

"I hereby certify, that I carefully measured and marked one acre of my corn-field of the present year, at my Appleby Farm, and requested the overseer to ascertain the product of said acre in corn. Sworn before JNO. NEWTON,

Justice of the peace for Dorchester county."

November, 1838."

The following by the overseer, Mitchell Shore.

"I hereby certify, that I did, at the request of Dr. Muse, carefully ascertain the product of corn on a space in his corn-field, at his Appleby farm, the present year, measured and marked by him, for one acre, and that it contained seventy-one bushels, and three pecks of shelled corn, the growth of said space.

Sworn before JNO. NEWTON,

Justice of the peace for Dor. county.

November, 1838."

It will be seen that the product of my drill-field, viz: forty acres at seventy-one bushels and three pecks per acre, was two thousand eight hundred and seventy bushels of shelled corn, or, "sufficiently near for all practical purposes:" and to this may be fairly added, a part of the immense contribution levied upon all our crops by a *fantastical morality*, and *self-willed* infatuation, (I *will not* use an epithet, possibly more appropriate,) which, in disregard of the laws of God and man, preferring *idleness* and *thievery*, to *industry* and *honesty*, have turned loose upon us, a Vandal swarm of freed negroes, who work none, and eat much; and of necessity, and most notoriously, live exclusively upon the industry of others; and this year, in evidence of the progressive boldness of accustomed villainy, they have taken, and before removal, *shelled* my corn in the field to a large extent.

In this field was contained, also, thirty-five acres more, which was planted in the usual manner, at four and a half feet distance, each way; and leaving *two* stalks, upon thinning; when *one* only at a point, was left in the other; in all other respects, the culture was like the former, except that it was *cross*-harrowed at the close of the cultivation.

It will be observed that the *drill* had a little more than nine thousand *stalks*; and the other, about four thousand to the acre. The growth of this was equally good; but the product, though not accurately ascertained, as intended, was unquestionably far short of the *drill*; but not in the ratio of the respective number of stalks—the ears being larger—yet, I think the difference of product, per acre, at least one-third in favor of the drill.

I have had, under a similar drill culture, on five acres, and in a less unfavorable season, one hundred bushels per acre; and my present report may not be interesting, as to quantity, yet, under the unfavorable circumstance of an unusual drought, and a *field* culture too, the result is flattering; and I have, at least, complied with my promise to make the report.

Your politeness will excuse its length, and its blots, when I assure you, the *quo animo* was absent in both offences; and you are at liberty to use it at your *discretion, absolute.*

I have omitted any notice of the geological and topographical character of the field, and will add it, concisely, for a fairer judgment in the case.

The field and the farm, with few exceptions, is a *level upland*, and by the measurement of our state engineer, is twenty feet above mid-tide of the Great Choptank river, near which it lies: though poor, and unproductive, when I purchased it some years ago, yet it was a well constituted soil, as to "silica" and "alumina;" the latter, rather preponderating, and the former chiefly coarse; but remarkably defective of "calcareous" matter, with which, and nutritive manures, I have largely supplied it; and it is well repaying the cost and labor.

JOSEPH E. MUSE.

P. S. Exception may possibly be taken by some, to the idea of an *antiseptic agency* of "*sun*" and "*air*"—when it is notorious, that the "*oxygen*" of the air, is *one* of the agents of *putrefaction*; and, that "*heat*" is *another*; yet, it must be remembered, that these require to be associated with "*moisture*," to produce the chemical change; otherwise they exert an energetic agency in resisting it; and, the presence of the *moisture*, must be *fixed*, and *continued*—and, not such, as casual showers, soon evaporated from the surface, would supply. J. E. M.

From the Cultivator.

CORN CROP.

Port Byron, Nov. 8, 1838.

Judge Buel—Sir—As I have been a constant reader of your valuable paper, the Cultivator, from its commencement, and think I have received much instruction and profit by it, I take the liberty to state to you some facts, that I think may be for the encouragement of some farmers.

Some time in March last, I commenced drawing manure from the barn-yard with two boys and a pair of steers, for the purpose of making them handy; the most of the time we used a horse before them. One of the boys lives with me, the other I hired at $5 per month. We drew the manure on a clover lay of three years' standing, about three acres. We put on the *whole*, 150 common wagon loads, spread it as even as we could, then ploughed, turned it over smooth, rolled and dragged it well, and planted the 11th and 12th of May, with Robbins' drill-barrow; planted what we call the 12 rowed yellow corn, but some ears have 20 rows, and from 10 to 15 inches long. Aimed to have the rows 3½ feet apart, hills from 1½ to 2 feet; from 2 to 3 kernels in a hill; rows north and south. I soaked the seed first planted in warm water, with a little salt-petre in it. The drill did not work well; I then took the dry seed and planted the remainder of it, which generally came up well; but before I knew it, the crows and worms had devoured a great deal of it. I planted it over, and part of it the third time, with the little golden corn. It nearly all stood finely. I went through it three times with a horse and cultivator; hoed it well the first time, was not quite so particular the next. I think it the best piece of corn that I ever saw in the state. Sometime the fore part of September, we cut it up at the roots, and stooked it up, but did not husk any until 15th October. It turned out so well, and was so sound, that I thought I would measure an acre, and see how much was on it. So we took the August No. of the Cultivator, the square and a rope measuring two roods long, went to the field and measured an acre, according to the rule laid down in said number; we measured the wagon box, or first load, 24 baskets full, holding almost 1½ bushels each; we had on the acre 169 baskets, or seven loads and one basket. We took one basket out of the heap, just as it came, and shelled it, and it weighed 37½ lbs. We husked a load more, and Mr. Cronkhite, one of my hands, thought the corn was still better; we then measured another acre as accurate as possible in the same way, 12 rood 3 feet by 13 rood 2½ feet; we husked off of that 166 baskets, or seven loads, wanting two baskets; we shelled one basket as before, and it weighed 39½ lbs. of shelled corn; the corn was husked and thrown down, the wagon going round to gather; shook down the corn, so that the loads might have been a little larger, and the corn rather sounder as there was not so much damage done on the second acre by crows, &c. Thus you see, the first acre had on it 112 bushels 23½ lbs, of shelled corn; the second had on 118 bushels 28 lbs. or 118½ bushels; the second acre had on it eight loads of pumpkins. The stalks are well saved, and are excellent fodder. I sowed turnip seed on the whole piece, but the corn and pumpkin vines so covered the ground, that the turnips are worth but little; a few bushels grew to good size since the corn was cut.

Expense of crop.

10 days with team and boys at manure	$10 00
5 days with young man and team do.	7 50
Parts of days ploughing, perhaps 5 -	7 50
1 day with drag at 12s. - -	1 50
1 day planting at 6s. - - -	1 75
1st hoeing, went through with horse and cultivator, 3½ days, with 2 men and 2 boys, worth - - - -	5 37
2d hoeing, 2 men and 2 boys 2½ days each - - - - -	3 75
3d hoeing, 3 men and 2 boys 2 days each - - - - -	4 75
4½ days cutting up, with a man and boy	3 94
	$46 85
One-third of the above, is	$15 35
3½ days husking 1 acre with 2 men and a boy - - - - -	5 25
Whole expense of one acre -	$20 60

Value of crop.

118½ bushels of corn from an acre, at 6s. 6d. amounts to - - - -	$96 31
8 loads of pumpkins, worth - -	8 00
Stalks would sell quick at - -	4 00
	$108 31
Deduct expenses - -	20 60
Net profit of one acre -	$87 71

I am yours, with great respect,
JOSEPH F. OSBURN.

Mentz, Nov. 13*th*, 1838.

This may certify, that I helped raise the said corn, or tend it, and measure, husk, shell and weigh it, and believe the above to be true to the best of my knowledge. JOHN HADDEN.

This may certify, that I helped measure the 2d acre as above, and husk it, and believe the above statement to be true. ABRAM KELLS.

P. O. Port-Byron, town of Mentz,
Cayuga county, 17*th Nov*. 1838.

I am personally acquainted with Mr. Joseph F. Osburn, and have no hesitation in saying that his statement contained within, is in all respects true; and further that any statement in agriculture coming from him may be relied on.
HORACE PERKINS, P. M. & J. P.

For the Farmers' Register.

REMARKS ON PENNSYLVANIA FARMERS.

For the benefit of travel to a member of my family, I left home in August, and was absent during the month of September, and a part of October. My wanderings were confined to some of the counties of Pennsylvania, east of the mountains. As I moved slowly, I had an opportunity of making some observations on the state of the country, and its agriculture. The farmers there depend but little upon books; few of them have heard of the theories and experiments of the Count Chaptal, and Sir Humphry Davy; but their practical agriculture and economy are of the best order. It is not uncommon for the southerners to esteem lightly the intelligence of the Pennsylvanians, (not including Philadelphia, where regular lectures, are delivered on all sorts of science, and the English language spoken in its purity;) but, as far as I was capable of judging, the farmers there, have as much useful, and practical knowledge, as I have found among people of the same class in any other section of the country. A gentleman farmer to the south, who commits the management of his affairs to an agent, has more time for curious inquiry and speculative theories; he rides his hobby at leisure, sometimes at the expense of a desperate fall; but it may be well doubted, if his pursuits be more profitable to himself, or to the public, than those of the Pennsylvanian, who sees carefully to his own business, and at need will lend a hand on its execution. It is quite certain, that the latter will "make two blades of grass grow on a spot of ground," and of much better quality, where the former will make but one. Popular delusions in most free states, will have an occasional run, and Pennsylvania has had its full share; but as far as my observation extends, excessive banking, anti-masonry, and the pernicious spirit of abolition, are on the decline. I hope I do not violate the laws of the Register, in saying that I think the "dark" oracles of Governor Ritner, in relation to the south, contributed to defeat his re-election.

Mr. Buckner in a late communication to the Register, states that the lands of upper Fauquier, for the production of grass, are not surpassed by any in the United States; if he rightly estimates the nature of the soil, it has not yet attained its ultimate point of production, and profit. I learn from his communication, that when red clover wears out in the fields of Fauquier, like the improved lands of the Eastern Shore, it is succeeded by blue grass. In Chester county, green grass follows red clover, which is greatly superior to blue grass, as it makes excellent hay, the richest pastures, and when the land is put in cultivation, having no fibrous roots, is easily subdued by the plough. A field set strongly in blue grass, requires a laborious hoe-cultivation to subdue it. I should deem it a hopeless, and injudicious enterprise, to attempt to put into fallow wheat, by the plough and harrow, one of my improved fields, which had been three years out of cultivation. Green grass like white clover, is a native grass. I I found it on my farm in small parcels, since my return home; I had heretofore not distinguished it from blue grass. Gen. Evans, an experienced, and intelligent farmer, informed me that he recollected when blue grass succeeded red clover, in Chester county. I infer from these circumstances, that green grass is brought into full growth by high improvement, and judicious cultivation; and perhaps the day is not far distant, when the fields of Fauquier, and some of best in lower Virginia, and the Eastern Shore of Maryland, may be clothed with rich crops of green grass. As a further evidence of its value, I quote a Philadelphia butcher, who told me that the best beef which came to that market, had pastured on white clover and green grass. White clover soon fails under our summer sun. Green grass is a hardy plant; though blasted by the severe drought of the summer, it recovered under the autumnal rains; and I saw it in great luxuriance and beauty, the last week in October. It would be worth the cost to a Virginia gentleman engaged in grazing, to visit Chester county in the summer; he might mix pleasurable relaxation with the more sober pursuits of improvement. The Yellow Spring is a fashionable watering place, resorted by some of the *elite* of Philadelphia, who, out of their own city, are civil and courteous to strangers.

Eastern Shore, Md., 14*th Dec.*, 1838.

From the Boston Magazine of Horticulture.

THE MORUS MULTICAULIS IN NEW ENGLAND.

This valuable tree has again, after the lapse of two years, been brought into notice, and from the many experiments which have been made upon it, in feeding the silk-worm, all of which have attested its excellence over all varieties, there has been a great demand for the trees. To such an extent has this demand been carried, that trees, which could not have been disposed of last spring at scarcely any prices, now command from fifty to seventy-five cents each. The consequence has been, that many, who were the fortunate possessors of large quantities of these trees, have realized handsome fortunes. Many individuals, stimulated by the stories which have been circulated in the newspapers and agricultural publications, of the immense profits which have been made in the sale of the trees, have entered into the business, purchased trees, and, though wholly unacquainted with them, have, in most instances, sold at an advance which has afforded them a good profit for their time and labor.

In New England, the cultivation of the mòrus multicaùlis has been almost wholly abandoned. Most nurserymen who formerly commenced their growth in considerable quantities, after having found that the sale of the trees was in no way proportioned to the ratio of increase, have, latterly, paid but slight attention to their cultivation; and now that the demand has been so great, and the prices so exhorbitant, they have but a small stock to offer, on which they might realize many hundred per cent. profit. The severity of our winters, for the three or four past years, has been such as to destroy thousands of trees; and farmers and others, who have left their trees exposed with the hope of acclimatizing them, have lost their whole stock; while other individuals, though not so unfortunate as to lose their trees in this manner, have, from a want of faith in the silk manufacture, taken no pains to increase their stock, and the present period has found them with scarcely a sufficient number of trees to commence their growth another year.

At the south this has not been the case; the trees there stand the winter without any injury, and when once planted in the soil there is very little danger of their loss afterwards; their growth too, is immense, when compared with the trees of New England. The season, there is two months longer, and the trees consequently attain to one-third more height than in New England. While, therefore, at the north the trees have not been increased, at the south they have been multiplied to a great extent; and of the many thousands of trees which have been offered for sale, and have changed hands the past autumn, two-thirds have been the growth of the middle and southern states.

The high price of the trees, it is thought, by many, is injurious to the cause of the silk manufacture; and that it will deter many gentlemen, farmers, and others from entering into the business.

We think not. The price of the trees is based upon the fact, that there is not yet, in the country, counting every tree of any size, a sufficient quantity to manufacture five hundred thousand dollars' worth of silk, only *one-fortieth* of the consumption of the country in 1836. Supposing, therefore, that the manufacture of silk can be carried on at a great profit, as has been satisfactorily tested, it will be some time before there will be trees enough in the country, notwithstanding their unbounded increase, to feed worms sufficient to manufacture one half the annual consumption of silk. Taking this view of the subject, the trees, at double the prices they are now held, would not be more than their intrinsic worth.

Professedly foreign from our province as the growth of the mulberry tree and the manufacture of silk is, we cannot help expressing our sentiments upon the subject. Whether the morus multicaulis will be the tree *best* adapted to the climate of New England, remains to be tested; but that it is the variety which will afford the best and most profitable food for the worms in the middle and southern states, there is no doubt. Perhaps the Alpine, the Brussa, or the Canton will do better in the severe climate of New England, where large plantations are to be made; at any rate, each and all of these should have a fair trial, and if, from their hardiness, they surpass the Chinese, let them take its place. We shall watch the progress of the cultivation of the mulberry with some attention hereafter, and note down the results.—*Ed. Hort. Mag.*

From the Farmers' Cabinet.

GEORGE HENRY WALKER.

[The following extract is a part of a more extended notice, which was read before the Philadelphia Agricultural Society. Mr. Walker was a highly valued contributor to the pages of the Farmers' Register. If his death had then been known, his name would certainly not have been omitted in our last month's brief allusions to the termination of the lives of several other persons, whose aid was much valued, and of which the cessation will be much regretted.—Ed. Far. Reg.]

The name of this gentlmen, by whose sudden death (which took place at his residence, Longford, in Philadelphia Co., on the 7th of Sept. last, in the 50th year of his age) the cause of agricultural improvement has lost a valuable and efficient friend, deserves honorable mention; and the following brief notice has been suggested as a slight tribute to memory of an enlightened farmer and most worthy man.

The pupil of some of the most celebrated agriculturists of the old country, Mr. Walker came hither and settled amongst us about twenty years ago, bringing with him no ordinary degree of intelligence and information concerning his favorite profession. He purchased a farm of about a hundred acres in Philadelphia County, where notwithstanding the discouragements which always obstruct the progress of agricultural reform, he illustrated the value of those improvements which his extensive knowledge and excellent judgment showed him to be desirable and necessary. He was the first to call attention to the relations existing between the laws of subsistence, occupation, and production, and to apply them as a principle to the improvement of agriculture. He was mainly instrumental in introducing a judicious system of root-culture. He demonstrated the importance of the green-crop system, of a better method of preparing and applying manures, and of an alteration in the rotation of crops. The utility of his improvements was shown by their results, and it may truly be said of him, that he made more than two ears of corn grow where only one grew before. He occasionally had under his charge young men of intelligence and character, who enjoyed the advantages of his rich agricultural wisdom and experience, imbibed his ardor, and who, upon farms of their own, are now carrying out his excellent principles of culture, and promising fair to perpetuate and extend the influence of his system.

From the Cattle Keeper's Guide.

METHOD OF ASCERTAINING THE WEIGHT OF CATTLE WHILE LIVING.

This is of the utmost utility for all those who are not experienced judges by the eye; and by the following directions the weight can be accertained within a mere trifle. Take a string, put it round the beast, standing square, just behind the shoulder blade; measure on a foot-rule the feet and inches the animal is in circumference; this is called the girth: then with the string measure from the bone of the tail which plumbs the line with the hinder part of the buttock; direct the line along the back to the forepart of the shoulder blade; take the dimensions on the foot-rule as before, which is the length, and work the figure in the following manner: girth of the bullock. 6 ft. 4 in.; length 5 ft. 3 in.; which multipled together, makes 34 square superficial feet; that again multiplied by 23 (the number of pounds allowed to each superficial foot of all cattle measuring less than seven and more than five feet in girth,) makes 713 lbs. and allowing 14 pounds to the stone, is 50 stone, 13 lbs. Where the animal measures less than nine, and more than seven feet in the girth, 31 is the number of pounds to each superficial foot. Again, suppose a pig or any small beast should measure two feet in girth and two feet along the back, which multiplied together, makes four square feet; that multiplied by eleven, the number of pounds allowed for each square foot of cattle measuring less than three in girth makes 44 lbs, which divided by by 14 to bring it to stones, is three stones two pounds. Again, suppose a calf, sheep, &c., should measure four feet six inches in girth, and nine inches in length, which multiplied together makes sixteen and a half square feet; that multiplied by sixteen, the number of pounds allowed to all cattle measuring less than five feet, and more than three in girth, makes 26 pounds; which divided by fourteen, to bring it into stones, is 18 st. 12 lbs. The dimensions of the girth and length of black cattle, sheep, calves, or hogs, will be as exact, taken this way, as is at all necessary for any computation or valuation of stock, and will answer exactly to the four quarters, sink the offal, and which every man who can get a bit of chalk, may easily perform. A deduction must be made for a half fatted beast, of one stone in twenty, from that of a fat one; and for a cow that has had calves, one stone must be allowed, and another for not being properly fat.

ACCOUNT OF THE NEWLY DISCOVERED PREPARATION OF "SHORT-STAPLE FLAX."

Published by the Delaware Manufacturing Company, of Lambertville, New Jersey.

The preparing of flax, of a suitable texture to be spun on machinery similar in its construction to that used in the manufacture of cotton, has been an object long sought after, and the mechanical skill of Europe has been exhausted with abortive attempts to accomplish this object. Various and ingenious have been the attempts to subject this useful article to operations of machinery, so as to reduce the enormous expenditure of human labor, which is now required to bring it into cloth of a fineness to become useful as wearing apparel. In Ireland and other countries, where linen is a material article of manufacture, the most of it is spun by the fingers; besides this tedious expensive method before the flax is in a condition that it can be worked by the hand-wheel, it has lost from three-quarters to seven-eighths of its original weight by the process of hackling, the most part of it being drawn out into tow.

The coarse *linens* that are spun on machinery, are also subject to the same loss of weight, and slow and comparatively imperfect method of spinning. By endeavoring to preserve the staple, the article is obliged to be subject in all cases to the hackle, as the only method by which the fibres can be separated and rendered of a sufficient fineness to allow them to be drawn into a thread. To remedy all these evils, to save this vast expenditure of labor, and also the enormous loss in weight, a late inventor has been led to a series of experiments wich has resulted in the production of an article, at a moderate expense, (not materially exceeding in cost the present price of cotton) that is capable of being converted into cloth of any texture, by the same process as cotton; thus bringing the cost of linen goods on a level with cotton.

We remark that it is our belief that a revolution is about to take place, equal if not parament to that produced by the invention of the *cotton gin.* Every description of linen goods is of yearly import to a vast amount, while at the same time large regions of our own country have a climate and soil entirely congenial to the production of flax, and it has only been prevented heretofore from becoming a staple article by the expenditure of labor required to make it marketable. By the late invention all these difficulties are abolished, and the material is rendered subservient to the *cheap* action of machinery from the time it leaves the hands of the grower, until it arrives at the consumer's market.

It is not to be expected that there will be any *immediate* reduction in the price of linen goods, as those holding the monopoly will of course convert it as much as possible to their own profit. Experiment has shown that linen cloth now selling in our markets for sixty cents, may be produced at a cost not exceeding twenty-five: by this datum a calculation of the value of the invention, and the profit that must for a long time reward the first prosecutors of the enterprise, may be easily made.

The Delaware manufacturing company of Lambertville, New Jersey, have contracted with the inventor, for the exclusive right of the invention for the state of New Jersey, at a price to be fixed by competent disinterested persons after the value of the invention is ascertained by experiments on an extended scale. Three hundred shares of the capital stock has been subscribed, and fifty dollars have been paid, amounting to fifteen thousand dollars, which amount, with debts which the company owe to the amount of four thousand dollars, has been invested in machinery and material; this machinery now in the hands of the company, is capable of turning out 1500 lbs. of lint per day, and is at this time in operation. In order to enable the company to carry on their operations to the *cloth*, it will be necessary to increase the subscription to three thousand shares, with the payment of five dollars on each share. By a resolution of the board, no further payment will be demanded *unless by the consent of three-fourths of the stockholders.* This amount of capital will enable the company to throw a quantity of the article into the market, and it is believed that the cloth produced after a short experience, will command a price equal to imported linens. We will here call the attention of the public to the advantages which the country must derive in a commercial and agricultural point from the success of the *short staple system* of working flax. Large regions of our west and north west, are admirably adapted to the cultivation of flax, and must, in time, rival the south with an article of export, and at the same time we shall save a vast amount of capital sent to Europe yearly to pay for this indispensable article.

It is the intention of the company to confine its operations to the *preparing of flax*, like the accompanying samples, to be sold to manufacturers who have the necessary machinery for converting it into cloth.

It is believed that, as soon as a number of the cotton spinners of this state, have changed their operations from cotton to linen, others will be induced to follow—and consequently a large demand for the material manufactured by the company. The company will of course find it for their interest to sell rights in other parts of the state, and the profits to arise from this course, as soon as the advantages are known, will be to a *great amount.*

The advantages to be derived from the short staple system for manufacturing flax, are as follows:

1. There is no loss of the fibre, as no tow is required to be taken out—all the lint is converted into linen of the finest quality.

2. The expense of labor required to convert it into cloth, is reduced to one-tenth the former cost.

3. The expense of bleaching in the flax is much less than in the cloth, and is not so liable to be injured in the process.

4. The operation of bleaching in the cloth takes from it a considerable weight of glutinous matter, and consequently leaves the goods open, and the thread soft-twisted. On the other hand by the *short staple* system, the glutinous matter is extracted before it is spun, and the thread will of course remain much more solid.

Having thus briefly stated the object and prospects of the company, we will here remark that, after considering all the advantages which the company derive from their contract with the inventor, (giving them the entire control of the state of New Jersey, which produces a larger quantity of flax per year than any five states in the union together,) the profit to share-holders must be very great.

Extract from sketches of the Upper Wabash Valley, by H. W. Ellsworth.

"For the purpose of ascertaining whether flax could be raised with advantage on the western prairies, Mr. Schermerhorn visited one of the largest flax manufactories in the United States, conducted by Mr. Sands Olcott, at New Hope, Pennsylvania. The results of that investigation will be found in the following letter, together with a description of the short staple we have mentioned:

New York, July 28, 1838.

"*Dear Sir*—Agreeably to your request, on my return from Washington city, I visited Mr. Sands Olcott, of New Hope, Pennsylvania, the gentleman who has discovered a method of preparing the short staple flax, (of which you showed me a specimen at the the Patent Office,) so as to make it into linen on the common cotton machinery now in use. It is, indeed, a beautiful and valuable article, having such a fine gloss or silky appearance, that most persons mistake it for raw silk. The introduction of this article will be of great importance to our country, and will produce a great and profitable change in our manufactories. I found Mr. Olcott very ready to communicate to me such information as I was in search of, in reference to the cultivation of flax, and manufacturing it into his short staple, with a view of ascertaining whether the raising of flax can be made profitable on our western prairies.

"From the information I have received, I have no doubt that linen of as good quality can be made from the short staple prepared by Mr. Olcott, as has been made by any method heretofore pursued. I know it may be conjectured that, by separating the fibre and bleaching it, in preparing the short staple flax, the linen made from it will not be of as good a quality as that made in the old way. But if you will go to the trouble of taking a few threads out of any piece of linen, and untwist them, and then pull them to pieces, you will find you have the same kind of article from it that Mr. Olcott calls his short staple flax. From this it appears to me that, by the ordinary process of water or dew-rotting, breaking, swingling, hatchling, spinning, weaving, and bleaching, the fibre of the flax, when manufactured into linen, in the common way, undergoes the same change in separating the gluten from it that is effected by Mr. Olcott, by a short and speedy process, before it is made into cloth. Indeed, I think it will make a better and firmer linen, because the gluten is perfectly separated from the fibre before it is woven; whereas, by the old method, much of the gluten remains in the fibre after it has been water and dew-rotted and manufactured into cloth, and which is separated by bleaching. Consequently, according to the quantity of gluten separated from the cloth, it becomes loose and open, though this defect the manufacturer studies to disguise by starching. From experiments already made, Mr. Olcott is satisfied that his short staple flax can be manufactured into linen, on common cotton machinery, as easy and cheap as cotton shirting can be made of the same quality. I mean now only as to the price of spinning and weaving per yard. If this be so, the flax crop will become of as much importance and profit to the farmers and manufacturers of the northern states, as the cotton crop is to the southern states; for the difference between linen and cotton cloth of the same quality, is about as one to four, or twelve and a half cents to fifty in favor of linen, while the flax crop can be raised in half the time, and with less than half the expense of a cotton crop. This discovery of Mr. Olcott will make as great a change in the linen trade as the invention of Whitney's cotton gin did in the cotton trade; and must, in a short time, greatly increase the demand, and enhance the value of prairie lands, in Indiana, Illinois, Missouri, and Wisconsin, which are admirably adapted to the cultivation of flax. Indeed, I have seen a wild flax, resembling our common flax, grow spontaneously in the prairie. Farmers settled on the prairies of the west will do well to turn their attention to the cultivation of flax, as one of the most productive crops they can raise. The lands in New Jersey and Pennsylvania, in the vicinity of New Hope, as an average crop, yield one ton to the acre of the stem, which sells readily at $12 per ton; and it is fair to calculate the flax-seed worth at least as much more from an acre, which will amount to $24, the avails from an acre of flax. This, the farmers here consider doing a good business. However, in our rich prairies of the west, we can raise from one and a half to two tons per acre, as easily as they raise one in New Jersey; and by sowing our seed the first crop on the prairie sod, we shall have no weeds for some time to contend with. Instead of being under the necessity of pulling our flax by hand, we shall be able to reap it with our mowing machines, and this will enable our farmers to raise very extensive crops, from which they will realise great profits.

"Mr. Olcott informed me, that in his flax establishment at New Hope, he works up about 3,000 tons of flax in the stem per year; and that this will produce about 430 tons of his short staple flax; that is, it takes seven tons of the raw material to manufacture one ton of short staple fine flax. The expense of manufacturing the fine flax, including the price of the raw material, is about $250 per ton. The expense of making this fine flax into fine linen, will be four cents a yard for spinning, weaving, and putting it up ready for market. This calculation is made on the supposition that prices for spinning and weaving will be about the same as that of cotton. In the above estimates, however, nothing is included except the expense of the hands that do the work. The interest on the capital invested, the risks on the building, and wear and tear of the machinery, are not taken into the account.

"I deem it very important for the interests of our country that linen factories should be established; and if the profit arising from this business was generally known, I have no doubt capital to any amount could be raised to carry them on very extensively. As I take a deep interest in this matter, I have endeavored to obtain all the information I could on the subject, with a view of calling the attention of capitalists to this branch of business. I will now give you briefly the sum of the matter:

"1. Estimate for buildings and machinery to manufacture 1,000 tons of short staple flax per year, according to information derived from Mr. Olcott, will cost about - - -	$30,000
"The actual expense of preparing 1,000 tons, including the expense of the raw material, at $250 per ton - -	250,000
	$280,000

"Now let us estimate this fine flax worth fifty cents per pound, which will not be deemed an extravagant price, when it is considered that every pound of flax will make from four to five yards of cloth, say four yards, and that this can be manufactured at *four cents* per yard. These 1,000 tons, being 2,000,000 pounds, will be worth, at 50 cents

per pound - - - - - -	$1,000,000
"Now deduct from this, as above, for buildings, machinery, raw material, and expense of manufacturing the short staple flax, - - -	$280,000
"Which leaves a profit, after paying for building and machinery -	$720,000

"2. Estimate for manufacturing the short staple into fine linen. I have been informed, by gentlemen engaged in cotton factories, that it is considered a fair and safe estimate, in establishing cotton factories, that every loom you put into operation will cost $1,000. This includes all expense for site, buildings, machinery, &c. A power loom, to go into complete operation, it is estimated, will turn out 30 yards of cloth a day. Then to manufacture 1,000 tons of fine flax, being 2,000,000 pounds, which will make 8,000,000 of yards, you must have in operation about 850 looms, which,

at $1,000 each, give - - -	$850,000
"For spinning 2,000,000 pounds, at 8 cents per pound - - -	160,000
"For weaving and putting up 8,000,000 yds., at two cents per yard -	160,000
"For 1,000 tons or 2,000,000 pounds of short staple flax at 50 cents -	1,000,000
"The whole expense of buildings, machinery, labor, and stock, for producing 8,000,000 yards of fine linen, is	$2,170,000

"If we estimate this linen at fifty cents per yard, then 8,000,000 yards, at fifty cents, is	$4,000,000
"Deduct for buildings, machinery, stock, and labor, - - -	$2,170,000
Which leaves the net proceeds -	$1,830,000

"Now, according to the above estimates, the farmers on the western prairies would make from a flax crop at least from $25 to $30 per acre from their land, which cost them only $1 25 per acre.

"The manufacturers of the raw material into the fine short staple flax, would make between two and three hundred per cent. on their capital invested in this business.

"And the linen manufacturer, after paying for all his buildings, machinery, stock, and labor, would clear nearly one hundred per cent. the first year; and after that his profits will also be between two and three hundred per cent. on his investments. From this it is evident that linen might be manufactured and sold from fifty to one hundred per cent. below the above estimated prices; and yet, all engaged in this business make it a very profitable operation. This would be a great saving to the consumers of this article. But this is not the only advantage the country will derive from the introduction and manufacture of the short staple flax; for we shall have introduced a new staple, admirably adapted to be combined with other staples, particularly that of silk. This will greatly aid the silk manufacturers of our country, and enable them soon to furnish a considerable quantity of this new and very substantial article for wearing apparel for the use of gentlemen. If our farmers and manufacturers were to turn their attention to the cultivation of flax and manufacture of linen, and of a silk and linen fabric, it would not only be very profitable to themselves, but annually save several millions of dollars to our country, which we now pay to other nations for linens and silks. This subject is certainly worthy the attention of every man who has the best interests and prosperity of his country at heart; and I hope it will claim the attention of the farming and manufacturing interests in the states most interested in this business.

"I have given you my views freely on this subject. They have been drawn up hastily; let them pass for what they are worth, and make what use of them you please.

"I am, with great respect, your friend, &c.,

"J. F. SCHERMERHORN.

"HON. H. L. ELLSWORTH.
Washington, D. C."

"We are aware that objections may be raised to the sum of fifty cents per pound for the "short staple;" though that price might be sustained by reference to the present cost of linens.

"The short staple, however, can be prepared at about $250 per ton, and afforded at twenty-five cents per pound, giving an immediate profit of one hundred per cent. Allowing it to be bought at this price, it could be manufactured into linen and sold at twenty-five cents per yard; yielding, in this shape, to the manufacturer, a further profit of one hundred per cent., as his reward."

It is found by experiment, that one acre of good land will yield a bale (or four hundred pounds) of cotton, ready for the market; and it is believed a similar amount of the short staple may be raised upon an acre of the western prairies. The calculation is as follows: Seven tons of the flax in stem are required for one of the short staple. At the rate, therefore, of one and a half ton, or 3,000 pounds) of the stem per acre, it will be found that each acre will produce four hundred and twenty-eight pounds of the short staple; a fact, exhibiting conclusively the future value of the prairies, should the culture of flax be generally adopted.

In many portions of our country, especially in New Jersey and New York, flax is raised with reference to the seed alone, and the lint is thrown away.

Mowing flax has been resorted to by many farmers, in preference to the tedious and expensive modes of pulling, heretofore in use. This, however, is a process which always leaves the stem entangled and difficult to break. In the new method of reducing flax to a fibre resembling cotton, it is believed that less care in gathering will be required; especially if the "brakes" are improved by the addition of transverse rollers, to crush the stem, in whatever position it may be presented.

From the Franklin Farmer.

THE SHORT-HORN FEVER.

Mr. Editor:—In a recent number of the Genesee Farmer, in an article headed "Kentucky Farming," the editor expresses the belief that "*the short-horn fever in the west, like the mulberry fever in the east, must be near reaching its crisis.*"

Although I will cheerfully accord to the able editor of that excellent paper a general correctness of opinion, yet I can but express my entire dissent to the above sentiment, in which, I humbly think the editor, has for once been vastly mistaken. He intimates that the demand and sales of the short-horns in the west is the effect of a *mania;* and is out of proportion to their value. Does he not know that at all the numerous Fairs in the west (the extensive reports of which he has seen,) the merits of these animals have been the subject of most rigid scrutiny; and that without a single exception they have carried off the palm? Does he not know, that for several years past, we have placed them beside our scrubs in the dairy, the slaughter house, and the feeding lot, and that their intrinsic merit and superior excellence have thus been proved beyond the possibility of a doubt?

So obvious and decided is the superiority of the improved short-horn over the scrub cattle, all things being considered, that it seems to be the fixed determination of every intelligent farmer in the west, to possess them, so soon as he can procure money to purchase, and grass to pasture them. In this they proceed upon an invaluable principle which should always be observed: *Keep no stock but the best of its kind.*

Hitherto these animals have been restricted to small districts in Kentucky, Ohio, and Tennessee, but more recently have been turning from these districts as common centres, with their heads and footsteps directed to every possible point of the compass. See the vast extent of territory which is rapidly preparing for and calling for these valuable animals. Illinois and Missouri are throwing enclosures around their vast natural pastures, (with a rapidity almost rivalling magic itself,) soon to be grazed by the best cattle which can be procured. Indiana, although inclined to a diversified husbandry, is rapidly acquiring a taste for grazing and good cattle. Tennessee is opening her eyes to a soil exhausting by cotton and tobacco, and sees in the growth of the blue grass, and the pasturing of cattle, the means of restoration and riches, and is even ordering the short-horns from England. Ohio and Kentucky themselves are not half supplied with this valuable commodity; and to say nothing of North Alabama, Arkansas and Wisconsin, the above states embrace a territory, (by reference to the Gazetteer,) of more than two hundred and thirty thousand square miles yet to be supplied with this excellent race. Allowing only one short-horn to the square mile, the stock we now have to breed from could scarce supply the demand in twenty years. So rapid has been the progress of improvement in the west, that for several years past we have not been able to produce a sufficiency of through-bred bulls to cross the common stocks with. Hence, so far from declining, the price of blooded cattle in Kentucky has steadily advanced, even through the pecuniary crises of the two last years; and is still advancing, notwithstanding the unfortunate death of several of the principal breeders in Kentucky, and some other circumstances, have combined to throw an unusually large number into market during the last summer and fall; and notwithstanding the general shortness of the crops.

I have heard that a cow sold in this section last month for $2000. She is not bad property at that price, for her last calf, though a bull, and only a few months old, sold for $800; and her next will most probably be worth as much. Nor could the calf be dear, for even in a herd of 20 *common* cows he would pay for himself in four years, every half blood calf being worth $10 more than a scrub calf (other things being equal) even for beef.

If there is any propriety in the foregoing calculations, the *mania* for the short-horns, so far from reaching its crises, is yet far, very far, from its climax. So confident am I in this belief, that this year, I have sold only about $1000 worth of stock, while I have bred nearly forty cows to a through-bred bull. The short-horns for years to come must spread through the country southward and westward, and the price for them will be still onward and upward. Let not those who wish to purchase, delay, under the vain expectation of a reduction in price, or they, like myself, may have to rue it, to the tune of many hundreds.

Yours respectfully,
A KENTUCKY FARMER.

From the Lexington Intelligencer.

SALES OF DURHAM CATTLE.

We learn that Henry Clay, Jr. Esq., has sold his imported improved short-horned Durham cow, Princess to John and Richard Allen, Esqrs., of this county, for $2,000; the highest price ever given for a cow *in* the United States.

At the sale of Thomas Smith, Esq., last week, the improved short-horned Durham calf, Grosvenor, two years old, by Talleyrand, imported by the Ohio stock company, was purchased by Thos. H. Clay, Esq., for $700.

As the vast improvement in the size and beauty of our stock, effected by the introduction of the Durham breed, has become more extensively known and appreciated, the pure blooded animals of this race have increased in value; and probably will continue to do so, until the supply is equal to the demand. Such has been the anxiety of stock raisers, not only of this county and state, but throughout the west, for a few years past, to possess themselves of through-bred Durham breeders, that the multiplication of the race has borne but a small proportion to the number of purchasers in the market. This will doubtless continue to be the case for a number of years. Fayette county was, we believe, the first place in the west where the improved short-horns were introduced, and, although several of our farmers have, for a number of years, been investing their capital, in the business, their sales have been so rapid, that few if any of them, have more of through-bred animals on hand, than are necessary for their own immediate purposes. That the business has been a source of considerable profit to them, and will continue to be so, cannot be doubted; but they have not received more than a just reward for their enterprise, and the care and attention they have given to the important subject of improving our breeds of cattle. It is a matter in which every farmer, and posterity, are deeply interested. As a mine of the richest ore is more valuble than one which contains nothing but the meanest metals, so is an agricultural country, stocked with the finest breeds of domestic animals, wealthy above that which possesses none but the unimproved scrub races.

The cow above stated, purchased by Mr. Allen, is one of superior form and size; the calf, we have also been told by good judges of stock, has rarely, if ever, been exceeded in appearance by one of his age.

ON THE PROPAGATION OF SILK-WORMS.

To the Editor of the Farmers' Register.

I have read with pleasure and profit, the essays of Mr. Gideon B. Smith, on the culture of silk, recently published in the Farmers' Register. But there is an objectionable passage in No. 2 which I hope Mr. Smith will consent to alter or suppress, when the essays shall be published in pamphlet form.

The language used about the writers of a polite, hospitable and scientific people is uncourteous, and the theory maintained erroneous, and calculated to do harm. I should not use such positive language, if I had not investigated the subject with unusual care.

I will now contrast the passage from Mr. Smith's essay with quotations from the Chinese and French writers and the result of my own experience since tho spring of 1836.

Mr. S. says "the recommendation of the French to separate the moths after they have been coupled *six hours*, is perfect nonsense, and is one of the ridiculous refinements that refined people have tried to apply to the silk-culture, without the shadow of utility to recommend them, and only remarkable for the great additional labour and perplexity with which they encumber the business. Like all the other *fooleries* of the French, I tried this, and got for my pains no other result, than a loss of about one-third of my eggs, which *were not fecundated*, as might have been expected. Let the moths remain together until they separate of themselves, and all your eggs will be good."

Nothing it seems to me, short of *infallible certainty* can justify the spirit and turn of this quotation; and to arrive at such certainty it is obvious that more than one or even two experiments are requisite. The subject is too important to be despatched in this hasty and peremptory style. It will appear from one of the following quotations, that Mr. S.'s failure to get good eggs may be accounted for without pronouncing a practice sanctioned by the combined experience of France, Italy and China, to be "*perfect nonsence*" and a ridiculous foolery.

"The moths which come out the first day are called *grass-moths*. The last of all, are called *mo-gno*, (that is to say: the last butterflies.) Neither of them ought to be kept. Only those which come out after the second day should be taken. The sheets of paper must be spread upon the cases of a shelf, then the males and females come close together and copulate. *When the evening comes, the male butterflies must be taken away*, and the females placed on sheets of paper, leaving an equal distance between them. The eggs which are found in lumps ought to be thrown out."—(*Chinese Treatise on the culture of silk, published by P. Force.*)

"After the cocoons have been taken down from the hedge, those which are intended for eggs, should be laid, but not crowded, on tables, that is to say, the males on one table and the females on another, that they may not copulate two soon, and before they have discharged a *viscid humor*, of a yellow reddish color, *which prevents their fecundity*. They discharge this humor in one hour after they come out of the cocoons."—(*Essays on American silk, by J. D. Homergue.*)

I have practiced the method described by the Chinese writer, five times, and have uniformly had the eggs well fecundated. The eggs may fail to become fecundated, not only for the *viscid humor* mentioned above, but also by delaying the union until the eggs are formed, and the females are ready to deposit them. Copulation may take place after this, but it will avail nothing. The moths usually come out of the cocoons between sun-rise and 10 A. M. Those which copulate about that time, should be spread out in pairs, where they cannot be disturbed by males seeking union with the female, until 4 P. M. The males must then be taken away, and the females left quietly to deposit their eggs.

The energy of the males is far from being exhausted when the females are satisfied, and if not taken away, such is their anxiety for re-union, that the females will be harassed, and confusion and disorder will be the consequence. Such at least, has been my experience; let others examine the subject carefully, and report the result of their observations.

Your ob't servant,
LAYTON Y. ATKINS.
Stafford County, Va., Dec. 31st, 1838.

From the Farmer's Magazine.

BEGINNING OF MARLING AND LIMING IN ROXBURGHSHIRE, SCOTLAND.

Marl was first applied, as a manure, in Roxburgh, by Lord Minto, as a proprietor, and by Mr. Dawson, as a farmer, about the year 1753; the former using his own shell-marl, which was not then to be had for sale, and the latter clay-marl; the former at the rate of 30 carts, the latter at the rate of 330 carts per acre. So soon as roads of communication were opened, lime immediately superseded the use of clay-marl (of which such enormous quantities needed to be applied;) though the county yields no lime, and the distance to it extends from 16 to 30 miles. Since the year 1772, shell-marl has been exposed to public sale; and since it was thus procurable by farmers at large, its application is becoming more general. From 20 to 25 carts, such as already specified, are given to the acre, of this shell-marl, in a dry state: it loses, in drying, a fifth of its bulk wet from the pit. The effects of marl are observed to be not immediate, but lasting: crops from marl are a fortnight later in ripening than those from lime, and the grain of less weight by one-tenth, in equal measure.

Lime is rather preferred even to shell-marl, its quicker operation suiting better with the short tenure of a tenant's possession. It is applied at the rate of six carts to the acre, in light soils; and of eight, ten, or sometimes sixteen, in clay soils.

From the Magazine of Horticulture.

THE ROHAN POTATO.

This celebrated potato will be very extensively cultivated the coming season. It is one of the most extraordinary varieties for productiveness ever known; nor are its eating qualities inferior. Though not held up to be equal to the forty-fold, the Mercers, and other well known kinds for the table, they are, nevertheless, equal, if not superior, to many of the potatoes which are to be found in our markets. For stock there is probably no crop that can be raised more productive. Twelve hundred bushels to the acre can probably be grown, if the statements of Judge Buel and others can be relied on, who have raised them. During the past dry summer, side by side with other kinds of potatoes, the produce was as ten to one. The severe draught affected the crop in a great degree, yet the produce was immense. St. Helena potatoes, a variety in considerable esteem, did not produce a crop that would pay the expense of digging, in the same ground where the Rohan afforded thirteen pounds to one planted. In our notices of vegetables, which will appear in our next number, we shall add some additional facts, relative to their growth, produce, and importance to the farmer.

From Loudon's Gardeners' Magazine.

CROSS FECUNDATION OF PLANTS.

The effect of the preceding winter on hybrid plants has led to some interesting results respecting cross fecundation. It is known to scientific gardeners, that, in the case of hybrids generally, the progeny takes the constitution of the female parent, while its characteristic features are those of the male. Hence, it might have been foreseen, that a cross between *Rósa semperflòrens* and the Ayrshyre rose, the latter being the female parent, would produce a much hardier progeny, than if the crossing had been reversed. It might also have been anticipated, that a cross between the tree rhododendrons of Nepal and the *Rhododéndron pónticum* of the temperate parts of Asia, the latter species being the female parent, would produce a much more tender progeny, than a cross between the Asiatic tree rhododendrons and those of North America, the latter being the female parent. Hence, we are able to account for the apparently anomalous circumstance of some of the Bengal hybrid roses having been destroyed altogether by last winter's frost, while others have been only partially injured; and hence, also, we discover the reason why the progeny of *Rhododéndron catawbiénse*, *Rhod. máximum*, *R. caucásicum*, &c., fecundated by *Rhododéndron arbòreum*, have stood the last winter, scarcely, if at all, injured; while the progeny of *R. pónticum*, fecundated by *R. arbòreum*, has invariably been killed down to the ground, or totally destroyed. While the loss of some hybrid arbutuses is to be accounted for on this principle, the mode of producing, by cross fecundation, a number of others which shall be nearly as hardy as the common species, is clearly pointed out. In short, the confirmation of the general principle, that, in cross fecundation, the constitution of the female parent prevails in the progeny, is, we think, the most important gardening feature that has transpired during the past year.

It has long been known, that, among plants raised from seed, whether the parent has been cross fecundated, or otherwise, there is frequently considerable constitutional difference in the progeny; some being hardier than others, and some being earlier or later than the average of the species, of coming into leaf or flower. These differences in seedlings may be seen on an extensive scale, in every hawthorn hedge and oak wood; and, in a more limited way, they are exhibited in seedlings of different sorts of evergreens, such as the arbutus, *Quércus Ílex*, Portugal laurel, *Magnòlia grandiflòra*, *&c.* The causes of this difference never have, and, probably, never will be, discovered; but, nevertheless, any facts which bear on the subject are worthy of record. Thus, it has been found that the severe frost of last winter produced a much more injurious effect on the narrow-leaved varieties of *Rhododendron ponticum*, such as *R. p. salicifolium* than on the varieties with broad leaves. The same remark applies to the narrow-leaved varieties of *Magnolia grandiflora*, *M. g. lanceolata* having had the foliage more injured than any other variety.

It is worthy of remark, that all deciduous trees and shrubs of the colder parts of North America, that had ripened their wood, have escaped wholly unhurt; while some natives of Siberia, such as *Lonicera tatarica*, though, when in a dormant state, they are capable of resisting the most severe cold of the British winter, were, from being in a growing state when the severe frost suddenly took place, severely injured. Even the evergreen magnolia of North America, *M. grandiflora*, in places where it was exposed as a standard tree, in the free air of the climate of London, only had its leaves injured, and that, in most places, but partially; the buds having broken out in the course of the summer, in every case that we have seen or heard of. On dry gravelly soil, in Hertfordshire, such as at Totteridge and Cheshunt, even the leaves of standard evergreen magnolias have escaped without the slightest injury; thus placing the hardiness of this fine tree beyond all doubt. Most of the beautiful species of *Mahonia* (evergreen berberries), from California, have also stood the winter, without their beautiful foliage having sustained the least injury. *Garrya elliptica*, an evergreen from California, proves to be of the same degree of hardiness as the common laurustinus. *Aúcuba japonica*, like many other Japan plants, ligneous and herbaceous, proves to be quite hardy. *Wistaria sinensis*, *Magnolia conspicua*, and *Illicium anisatum*, from China, and *Chimonanthus fragrans*, from Japan, are also as hardy as any of our natives, and will, in consequence, in all future time, prove conspicuous ornaments in British gardens. The lesson which the young gardener has to learn from these facts is, that it is not enough for him to know the general principles of plant culture, as taught in books, and practised in British gardens; but that it is nearly equally necessary for him to have a knowledge of the geographical range, and of the soil, and the elevation above the sea, as far as these can be obtained, of every foreign plant which is committed to his care.

From London's Gardener's Magazine.

BREAD WITHOUT YEAST.

A baker in London has just taken out a patent for the manufacture of a light bread, the qualities of which depend neither upon leaven nor yeast. He substitutes for these materials bicarbonate of soda and hydrochloric acid, in such quantities as to enable the acid to combine with the soda, and thus form common salt; while the carbonic acid is disengaged, swells the dough, and gives it that spongy appearance which characterizes light bread. The following is the manner of operating:—

To 7 lbs. of wheaten flour mix from 350 to 500 grains of bicarbonate of soda, and nearly a bottle and a half of distilled water. In another vessel, the necessary quantity of acid (420 to 460 grains of muriatic acid of the shops are, in general, necessary) is mixed in about half a bottleful of water. It is indispensable to dilute the dough well with the solution of soda; and, when all is well prepared, the acid is poured on it. Pastry may be treated in the same manner. The quantity of bicarbonate used varies with the degree of lightness required for the paste.

From the Journal of Commerce.

BROOMS.

A cargo of corn brooms has been landed here during the last week, from George-town, D. C. Messrs. Geo. C. Mason & Co., have established a factory there, capable of turning out a thousand a day, and they have already obtained sufficient attention to the matter by the farmers in the neighborhood to furnish them with great quantities of corn of a fine and long fibre, surpassing, it seems to us, that which is grown under the most favorable circumstances at the north. The brooms are very neatly manufactured, so that any young lady might well be proud to be seen every day with one of them in her hand. We are glad to see the rivalry of the south against the north in some of these Yankee notions. Besides, we do not know that there is a more appropriate place in the country for an establishment of this kind, than the District of Columbia; for there, more than elsewhere, a thorough sweeping out is often requisite, in order that affairs may be kept in tolerable order.

From the Southern Agriculturalist.

CORRESPONDENCE AND REPORT ON THE DEFECTS CAUSED BY BAD MANAGEMENT OF FINE SEA-ISLAND (OR LONG STAPLE) COTTON.

Charleston, S. C. Sept. 21*st*, 1838.

Messrs Browns & Welsman,—

Gentlemen:—We beg to direct your attention, and that of your friends, who are growers of fine sea-island cotton, to the subject of the annexed letter, addressed to our friends in Manchester, by a highly respectable house engaged in the fine spinning [trade. We are all aware of the objecable feature in fine sea-island, of which not only the above house, but also all the other fine spinners have repeatedly complained; and we trust you will agree with us in deeming the subject of sufficient importance to be submitted at once to the notice of our planters. Their known skill and perseverance may devise some means of abating, if not removing altogether, the evil pointed out. Accompanying the annexed, we have samples of the different styles of preparation, from the most faulty to that which is referred to as a specimen of the perfect; and we invite you to call and examine them. Requesting you will aid us in giving circulation to the annexed.

We remain very respectfully, your obt. svt's,
Gourdin, Matthiessen & Co.

Manchester, (Eng.) August 2, 1838.

We have often, in conversation with you, expressed our regret, that the growers of fine sea-islands, in so many instances, injured their cotton, by stringing and matting it in the getting up; and in hope of drawing their attention to the subject through the medium of your house, we beg to trouble you with the following observations.

Fine cotton yarn is esteemed in proportion as the thread is uniform in substance, free from lumps, and strong. The latter has been decidedly improved by the introduction of the select seed cotton, but the levelness of the thread has been impaired rather than otherwise, and this arises from the multitude of small white specks, or nitters, with which the staple of the finer and softer kinds of sea-islands, and the select cotton seed particularly abounds.

In examining these nitters through a microscope, we find them in general composed of kinds of fibres, presenting an appearance much resembling the misletoe plant in this country, and for some time, we feared they were excrescences peculiar to the fine fibre, and inseparable from it; but the two recent samples of beautifully fine select seed cotton, sent us by you, are so free from this defect, that we have now a strong impression they are chiefly produced by an *overhandling* in the getting up; at least, we can multiply such nitters here, by mismanagement in the cleaning process; and, we have no doubt, the same effect is produced in America. We would, therefore, strongly urge the planter's attention to this point; for, in all cotton goods, such as gauze, muslins and laces, it takes immensely from their value and beauty, and limits the use of the finer yarns, which are chiefly used for these articles. As an instance of this, we may state, that one of our customers informs us, he frequently pays from 9*d.* to 1*s.* per yard, upon his finest muslins, for picking out the nitters, one by one with a needle, after the goods were woven—an expense which is equal to from 10*s.* a 30*s.* upon each pound weight of muslin. Our experience has proved that the softer and more silky the staple, the more easily it is nittered; and, as the spinners possess no means by which nitters can be removed from the cotton when once formed, the only means of remedying the evil, *is to prevent their formation.*

To this point, therefore, the attention of the grower should be strongly directed. *All unnecessary handling, whipping, tossing, or shaking of the cotton,* ought to be avoided. It should be as well cleaned as possible, but yet *free from stringiness,* and the fibres be left in the loose and disentangled state they appear in when just separated from the seed. If this were attended to, it would materially improve the appearance of fine yarn, and remove the never ceasing complaints of the fine muslin manufacturers, and we are persuaded, tend to increase the consumption of fine cotton goods.

Any reform you can bring about in this matter will be a benefit to trade, and oblige,

Yours, &c.

The committee, to whom was referred the letter of a respectable house in Manchester, England, engaged in the manufacture of fine sea-island cotton, respectfully report, that the matter to which their notice has been directed, is one of deep importance to the grower of that valuable staple production. If, in consequence of his neglect, or want of skill, a pound of muslin, which would otherwise command its full price, is depreciated from 10 to 30 shillings, duty and interest obviously impel him to the providing of a remedy at once prompt and efficient.

Through the politeness of Messrs. Browns and Welsman, three samples of cotton, being specimens forwarded from Manchester, were received from Messrs. Gourdin, Matthiessen & Co. These samples are endorsed as follows:—"No. 1, illy got up and nittered," "No. 2, illy got up and partially open," "No. 3, well got up." In examining the "nitters" in No. 1, through a microscope that magnified one thousand times, they were discovered to be, in general, of a globular form, and to consist of filaments of cotton, with interstices of various diameters, readily reducible in size, by pulling the long threads attached to the mass. This, however, could not always be done, as the knot of fibres, constituting the nitter, was, in many instances, too strongly formed. The committee next proceeded to the examination of samples of seed cotton. In about a pound, personally gathered by one of them, from *fully matured* pods, produced from *healthy* plants, no nitters were observed. In the same quantity, picked from *diseased* stalks, which bore *defective* fruit, several were seen. These were subjected to the test of the microscope, and precisely the appearance that characterized those taken from the ginned cotton in No. 1, was exhibited. Repeated inspections since, have produced no marked variation in the general results. The committee, therefore, with confidence, deduce the inference, that preparation, except perhaps in the isolated instance hereafter to be noticed, is not the cause of the nitter. In confirmation of the opinion, putting aside the conclusive facts adduced, the different processes through which the cotton passes, whilst in the hands of the planter, need only to be briefly adverted to. After the stained is separated from the white, the latter is thrown, in small parcels, into a whipper, in order to extract the dirt and to throw off the short and weak fibres, which, if allowed to remain, would detract very materially from the value of the crop. This machine, constructed of wood with round wooden teeth, is turned by the hand. Unless the door of the whipper be closed, which is never done, the egress of the cotton is quickly effected. After this operation, the cotton is ginned and then taken to the moting house, where, on a frame of wood work, it is gently shaken and partially opened by the hand. When clean, it is received by the packer, who, with a wooden instrument, compresses it into a bag, weighing, when finished, from 300 to 400 pounds. In these various, but necessary, modes of treatment, in not one of which any violence is used, the committee feel persuaded, that the staple sustains no injury whatever. It is well known that every description of cotton, except the finest qualities of sea-island, before it is converted into fabrics, is subjected to numerous operations, all of which are performed by machinery. From the willow, which, by its revolving spikes, tears open the matted masses, succeeded by the scutching machine, in which the cotton is beaten by metallic blades, revolving on an axis at the speed of from 4000 to 7000 revolutions in a minute, other machines with iron fingers, teeth and wheels, follow, so that it may almost be said that, without the aid of human hands, the vegetable wool "is opened, cleaned, spread, carded, drawn, roved, spun, wound, warped, dressed and woven."

Now, although it is represented, that the superior qualities of black-seed cotton are not thus wrongly treated, yet, as they are "opened and cleaned by being placed upon cords stretched on a wooden frame, and then beaten by women with smooth switches," the committee are at no loss to perceive how the complaints of the manufacturers by their own act may be increased. This last mode of cleansing the raw material was very generally pursued by the planter a few years ago. Were he now to resume that ready method of preparing his crop for market, he is satisfied, that whilst his time and labor would be saved, the fabrication of fine goods would be likely to incur an additional expense of no ordinary magnitude. By using switches, it is nearly certain, that the weak fibres are broken into minute parts and with the naturally short and rotten, intermix and become entangled. Although, therefore, the imperfection of staple, which is the special subject of this report, is undeniably common to the cotton plant under peculiar circumstances, the committee incline to the opinion, that that imperfection can be created by artificial means, and from experiments instituted by them, is engendered by the different processes through which the cotton goes in its conversion into cloth, as already particularly described. That the nitter, however, is occasionally formed through the want of foresight on the part of the planter, when his crop, from adverse seasons, or other causes, is defective in texture, is highly probable. The filaments of unripe cotton, are transparent cylindrical tubes. When ripe, even before the capsule bursts, the tubes collapse in the middle, forming semi-tubes on each side, which give to the fibre, says Mr. Baines, in his able treatise on the cotton manufacture of Great Britain, when viewed in certain lights, the appearance of a flat ribbon, with a hem or border at each edge.* Unripe cotton† is finer than that which has attained its full age, but is deficient in the other essential attributes of a perfect staple, strength and length. Some of the filaments, indeed, are not the eighth of an inch long, and until several days after the opening of the capsule, are found doubled or curled, full of watery and oleagenous particles; the cotton is wet to the touch and is of a brown hue. In this state, unless dried in the sun, it becomes more or less mouldy; the superfluous oil from the seed, which ought to have escaped, is diffused through the mass; the color soon changes; heat is generated; and the staple, originally strong, is quickly perceived to be materially affected. Hence, it is not surprising, that in immature cotton, distinguished, as it is known to be, for its delicacy of texture, variableness in length, and want of pliability, when subjected to the mildest mode of treatment to free it from extraneous matter, the threads should cross and mix with each other; thus forming artificial nitters. Within a few years, the action of the sun, with a view to the desiccation of the wool, has been sedulously avoided by, perhaps, a majority of our planters. The daily gatherings are spread in houses, or under scaffolds erected for the purpose, and thus the drying process, if a few exposures in that way is worthy of this appellation, is conducted. That the practice is radically wrong, for the reasons already assigned, the committee firmly believe. Damp cotton, also, can neither be ginned nor cleaned but with difficulty: this of itself is a serious objection, to which may be added the indubitable fact that, from its too unctuous properties, the floating dust of the atmosphere tends to its discoloration.

From these observations, it will appear, that nitters are either natural or artificial, and that both are primarily to be traced to a defective staple, arising from diseased plants; that the artificial nitter may be generated even by the common method of preparation, unless the cotton be judiciously dried; and that the means to which the manufacturer is obliged to resort, are evidently calculated to bring about the same results.

Of these samples, Nos. 1 and 2, which are "illy got up," are lumpy and stringy, of a deep yellow tinge, and weak and uneven in fibre. The cottons, from which these are taken, it is likely, were never dried: it is still more probable, that they were the product of a scanty harvest. No. 3 is of natural color, open, and, in texture, strong and long. It is necessary here to remark, that the stringy appearance of cotton is not always, or even mainly, the fault of the planter. It arises principally from the same cause to which the nitter is referable; the imperfectness of the staple, or the immaturity of the fruit. This was especially true the last year.

To two considerations, pertinent to the matter under review, it may be proper to advert. In every field, no matter under what sinister circumstances the crop has grown, there are small sections in which the plants come to perfection and bear healthy fruit. From these, the cotton that is picked is marked perhaps by every characteristic of the best staple, yet, almost from necessity, it is thrown into the general bulk. Again, in harvest season, the laborer cannot stop to examine, if he had the ability to know, the variant qualities of the cotton he is engaged in gathering, but promiscuously the bad, the fair and the good, are blended. This is unavoidable. Subsequently the stained is separated from the white, but the weak and strong continue together; a part only of the most deficient of the former, being afterwards detached by the whipper.

On the immediate topic of inquiry, the committee ask leave to conclude with the following suggestions:

1. The necessity of dying cotton in the sun, for three or four hours, as its dampness may seem to indicate.

2. Select seed for planting, not with a view to superiority of staple, but the production of sound cotton. For that purpose, choose from *healthy* stalks those pods that are *fully blown*.

3. The first pickings should be set apart, and not mixed with the general crop. The fibre is weak and short. The same course ought to be pursued with cottons gathered after a storm or much rain.

4. Cotton ought to be thoroughly cleansed before it is carried to the gin. If it be well done, the after-labor will be trifling, and the fault of over-handling avoided. Too much pressure on the roller gives to the cotton a matted appearance; if the pressure is unequal, it will be stringy.

Before closing their report, the committee would offer a few reflections, not irrelevant, they trust, to the occasion. For many years the sea-island crop has scarcely repaid the toil and perseverance incurred in its production. From highly unpropitious seasons, the ravages of worms, and the cultivation of a plant, peculiarly delicate and unfruitful, it may in verity be said, that it is annually a subject of congratulation with the planter, if his necessary expenditures do not exceed his profits. Except 1826, when the exportation was about six millions of pounds, from 1833 to 1835 inclusive, the production was less, by from one to seven millions, than at any former period since 1821.*

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* "The twisted and cork-screw form of the filament of cotton, distinguishes it from all other vegetable fibres, and is characteristic of the fully ripe and mature pod. This form and character the fibres retain ever after, and, in that respect, undergo no change through the operation of spinning, weaving, bleaching, printing, and dyeing, nor in all the subsequent domestic operations of washing, &c. &c., till the stuff is worn to rags, and then even the violent process of reducing those rags to pulp for the purpose of making paper, effects no change in the structure of these fibres."—From the difference between the elementary fibres of cotton and flax, the latter being transparent tubes, cylindrical, and articulated or joined like a cane, it has been incontestibly proved, that the mummy cloth of Egypt was linen.

† By immature or unripe cotton, is meant cotton, that, from unfavorable seasons, &c. &c., is made to open prematurely. The pod, about half the size of the full grown boll, becomes black, and, as soon as it has been hardened by the atmosphere, bursts and discloses the imperfection of its fruit.

From these facts, added to the wonderful machinery, which enable a workman now to perform the work required of two or three hundred men, sixty years ago; the increase of population in those countries, where the finest goods are used, and the decrease in the rates of duties in Great Britain, it was reasonable to infer, that an augmentation of price, in some measure, proportional to the diminished production, would have taken place. From 1821 to 1829, inclusive, when the average export was 11,016,418 lbs, the average price in Liverpool was 19d. From 1830 to 1835 (excluding 1833, the export of which year is unknown to the committee) when the average export was reduced to 8,208,194 lbs., the average price was a low as 17¼d.† The committee have been unable to procure the official account of the exports for 1836 '37, '38. They believe, however, it would be safe to say, that the product of last year, and the year preceding, was over six millions of pounds. Hence, if this be true, the two united was considerably less than the single crop of 1826, and but little more than either that of 1821 or of 1822. The present crop, it is confidently believed, will not exceed, if it eqaul, the last.‡ Although the compromise on the tariff question, in 1833, gave an impetus in the cotton trade and manufacture, which, by a salutary reaction, raised the price of the great product of our industry very considerably; yet, it is nevertheless true, that from meagre harvests, especially in 1836 and '37, over 4 per cent. has not been realized by the planter. The crop of 1821, which was over 11 millions of pounds, brought 21¼*d*.; that of 1836 and of '37, *united*, amounting, it is presumed, to about 12 millions of pounds, commanded only the average price of 25*d*.

The committee are aware that, in consequence of the interest of money, and the profits of capital having fallen almost universally in Great Britain, every branch of industry in other countries, in any wise dependent on the skill, enterprise, or capital of that commercial and manufacturing power, has also suffered. Without adverting, however, to the numerous causes which are at hand, for the anomaly which the statistical information, presented in this report, so clearly establishes, one only of the most prominent the committee would name—the practice of mixing the different sorts of cotton together. There is no kind, except the finer descriptions, says Mr. Baines, which is now confined to any exclusive purpose. The long staple is generally used for the twist or wrap, and the short staple for the weft. In this way, the black seed is made to participate in the changes, which, no matter from what cause, mark the market value of the green seed. This, perhaps, is the strongest reason why a more decided inequality in price, between the fine and superfine qualities of long staple cotton, ought to exist; to which may be added, the variety of uses to which the former, alone or mixed, are applicable. From these considerations, it is apparent, that, in relation to those two descriptions of vegetable wool, the one is really worth from two to three-fold more than the other, instead of from 30 to 50 per cent., which continues to be paid.*

In our unremitted efforts to produce the finest cottons in the world, sad experience shows, that we are engaged in an unprofitable enterprise. It is annually proven, that the cultivator of the common qualities, realizes a much larger interest on his capital, than he who can readily command 70 or 80 cents per pound for his crop. So general is this persuasion, that the raising of hardy and productive plants, without reference to the texture of the wool, is now the main object of our desire.

All which is respectfully submitted by

WHITEMARSH B. SEABROOK,
JOHN JENKINS, } *Com.*
GEORE W. SEABROOK,

From the American Farmer.

MR. INGERSOLL'S PIGGERY.

[We have the satisfaction to publish the following account of the most perfect system of breeding swine, that has fallen under our observation. We have visited the establishment which it de-

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*Number of pounds of sea-island cotton exported in

1821	11,344,066	1830	8,147,165
1822	11,250,634	1831	8,311,762
1823	12,136,688	1832	8,743,373
1824	9,525,722	1833	
1825	9,655,278	1834	8,085,985
1826	5,972,852	1835	7,755,736
1827	15,140,798	1836	
1828	11,288,419	1837	
1829	12,833,307		

			Average.				Average.
†1821,	12½	to 30d.	21¼	1830,	11¼	to 20d.	16d.
1822,	10	28	19	1831,	9½	18	13¾
1823,	11	24	17½	1832,	9½	18	13¾
1824,	11½	27	19¼	1833,	10½	22	16¼
1825,	15	42	28½	1834,	18½	26	19¾
1826,	10	30	20	1835,	14	33	24½
1827,	9¾	20	14½	1836,	14	36	25
1828,	10	22	16	1837,	12	40	26
1829,	9	21	15				

2s. 11d. per cwt. In 1821 the duty was six per cent. ad. val.

The table from which the above (to 1833) is taken, was published in 1833, by Messrs. George Holt & Co., of Liverpool. It exhibits the extreme prices of cotton and wool in that place, from 1806 to 1835 inclusive. The statement of prices from 1834 to 1836 inclusive, is extracted from a Liverpool circular, published in January last. The difference between the extreme prices has been assumed as the medium price. What the average price really was, cannot, with certainty, be stated.

‡At a meeting of the Agricultural Society, held on the 12th Nov., it was unanimously resolved, that the members forthwith furnish a statement of the probable product of their cotton crop, which resulted in the average of 64 lbs. per acre. This was intended to be appended to the report of the committee and published. The reported average last year, was 76 lbs. per acre.

* One pound of cotton usually makes 8 yards of coarse muslin, and is then increased in value from the raw cotton, eight-fold. But, if spun in the finest yarn, it is worth 5 guineas, and in 1780, if woven into muslin and tamboured, was worth £15. It may now be converted into a piece of lace, worth 100 guineas.—*Report of the Secretary of the Treasury*, 1836.

The finest quality of sea-island cotton, remarks Mr. Baines, in ordinary state of the market, is worth three times as much as the common quality of the same class. The varieties in quality, in most of the other denominations, is from 20 to 25 per cent., and in none of them is more than 50 per cent.

scribes, and heard with pleasure the explanations of its intelligent owner, upon the different parts of his plan. And from our desire to profit by his experience, we subsequently requested him to give us a written description of his piggery, and the management thereof, which he promptly furnished, in a letter that invited us to pursue our inquiries; and these procured for us the more ample details contained in his second letter. It was our wish to publish these communications soon after they were received, but we could not obtain his express permission to make that use of them; therefore, we have withheld his letters from the press until the present moment when we are assured that the cause of his reluctance has ceased to exist; and that his plan may now be made public, without any prejudice to his interests, or violation of his wishes. This system challenges our admiration, and we cheerfully render it to his head and heart. How few of us take equal care of superior animals! And there are not many who carry equal method into their most important avocations—errors, which may justly be ascribed to defective education. It is easy to perceive in every part of Mr. Ingersoll's proceeding, that confidence which merchants feel in the employment of capital at some risk, and heavy charges, for the production of a probable and fair, although remote profit, through a definite channel. With such hopes and calculations, education had made him familiar, whilst it gave him habits of critical investigation that must ever secure to their possessor eventual success in any occupation to which he may devote himself. As a farmer, we perceive that he has derived a handsome livelihood from the cultivation of a few acres of land, and the employment of a small capital, in connexion therewith; whilst there are many proprietors of princely estates, who can scarcely contrive to banish want from their domains. We have pointed to the chief cause of such painful deficiencies; it remains for parents to diminish their number in future times, by taking present and suitable means to qualify their children to pursue their respective occupations with benefit to their families, and advantage to society. And whilst we are zealously laboring to amass property for our offspring, let us not be unmindful of their intellectual treasures, but remember always that the improvement of these can alone teach them how to enjoy and augment the wealth that we may give.]—*Ed. Am. Far.*

Brookline, Oct. 30th, 1821.

DEAR SIR,—I have, this evening, received your favor, dated 1st inst., inclosing some valuable seeds, and two numbers of your publication, for which I beg you to accept my acknowledgments. I should feel mortified that your interesting journal should have been published near three years, without my availing myself of its information. The fact is, I have been a subscriber through our mutual friends Messrs. Wells and Lilley, from the beginning.

I am happy to hear of the safe arrival of the pigs, and more gratified that you are pleased with them. It will give me great pleasure to send the boars you wish in the spring; and they shall, as you desire, be of different parentage from those you already have. I am fully satisfied, from repeated trials, that a fine race of animals cannot be kept up by breeding *in and in;* and I have both in my sheep and swine, two distinct families, which are crossed with each other. And except to supply the number of each kind I want to breed from, the individuals of the same family are never allowed to come together. By attention and strict adherence to this plan of crossing, where both kinds are good, I have a fine healthy stock. The animals are improved, both in size and symmetry, and their disposition to get very fat, at an early age, has been increased. At twelve months old, the pigs you saw in my various pens, averaged 280 lbs.; and many of them exceeded 300 lbs. each. This weight as they were fed almost entirely upon vegetables, was very satisfactory. A larger race has been often recommended to me by my neighbors. But a large race would not only require more food, but it must also be of much richer, and of more expensive quality. Boiled cabbages, turnips, and other vegetables, whose acreable produce is large, and which constitute the principal sustenance of my own breed, would make but poor returns when given to a larger framed animal. My establishment consists of twelve breeding sows and two boars, that are kept as long as they bring fine litters of pigs; failing in this, they are fatted, and their places supplied by others of one year old, before they are put to the male. The sows are put with the boars the 1st of April, and the 1st of October, and farrow twice a year. Their inside pens are eight feet by five, and their outside pens are three by four feet. About the time they are expected to bring forth, the styes are littered with straw cut into chaff, very fine, that the little pigs may be dry and warm, without being entangled with long straw, and thus destroyed. The litters are always regulated so as to leave not more than eight pigs to any one sow, either by changing their mothers, when necessary, soon after their birth, or by removing supernumeraries. I have always found a family of eight pigs at a month old, worth more than one of twelve; their growth being so much greater. From each outside pen the pigs have access through a small hole, to a common yard, which is always kept well littered; in which they play; and where dry corn is placed in shallow troughs to induce them to eat as early as possible. Each party knows their mother, and they find their respective pens without difficulty. These pigs are *always* weaned the 1st of October, at six or eight weeks old, that the sows may be again in the way of their duty, and my system progress. From these pigs I select seventy-two, and dispose of the rest. They are put into twelve pens, containing six each, and are fed with the best food my swill trough affords, six times per day, for the first month, and three times per day afterwards. The inside pens are six feet square, and the outside four feet by six, both planked, with a quick descent for the dirt, &c. to be carried off. Much, *indeed everything,* depends upon their sleeping dry and warm, and being well littered, and kept perfectly clean. In these pens they remain six months, or until October and April, when they are all transferred to the fatting pens, and their places supplied by the newly weaned pigs. The fatting pens are planked—there is a cellar under them, and each pig is allowed an area of about twelve square feet to live in; for these there are no outside pens. The fatting pens are cleaned out every morning, and fresh litter given. For three months the pigs in them are fed from the swill trough as store pigs; at the end of which time, say January and July, their fatting commences, which consists in adding, for each of them three quarts of cracked corn to their daily allowance of vegetables, for three months, when they are killed as near the first of October and the first of April as may be. Thus you will observe the 1st of October and the 1st of April are busy days in my piggery, and the little pigs are then weaned, the sows again put to the boars, the fat hogs sold off, the store pigs removed to the fattening pens, and my system completed.

To feed this stock, consisting of

72 pigs from one to six months old, and
72 pigs from six to twelve months old, and
12 old sows, and
2 boars; in all

158 mouths—we boil a kettle of vegetables, containing six bushels, to which is added one bushel of cracked corn three times a day, and after putting this mass into the swill trough and mixing it intimately, we add as much water as will make 112 gallons, or for each bushel of vegetables and corn sixteen gallons. This swill is then distributed *sweet* and *warm* to the stock, morning, noon, and night, with great regularity, in the following proportions, viz:

In October, November and December—to each of 72 pigs, from one to three months old, one gallon; and to each of 72 pigs from six to nine months old, three gallons.

In July, February and March—to each of 72 pigs, from three to six months old, two gallons; and to each of 72 pigs from nine to twelve months old, 2 gallons, with 3 quarts of corn.

In April, May and June—to each of 72 pigs, from six to nine months old, 3 gallons; and to each of 72 pigs, from one to three months old, one gallon.

In July, August and September—to each of 72 pigs, from nine to twelve months old, 2 gallons; and to each of 72 pigs, from three to six months old, 3 gallons with 3 quarts of corn.

8 galls. 8 galls.

And these eight gallons, divided by their terms, or four, show that on an average, throughout the year, two gallons are required daily per head for the 144 pigs; or equal to 288 gallons; and to our twelve breeding sows, and two boars, we give per day, three gallons each, or equal to 42 gallons, making, altogether, an aggregate of 330 gallons; thus quite consuming our three messes of 112 gallons each. By the different ages of the pigs, as above combined, we have a constant and daily call for the same quantity of swill throughout the year, so that our business proceeds with perfect regularity.

Baltimore, Nov. 21st. 1825.

Dear Sir,—Your detailed account of the management of your piggery, has afforded me great pleasure and instruction. And your very obliging offer to send me a list of the vegetables raised for your monthly supply, tempts me, not only to ask for it, but for some other explanations which you likewise proffer. I am anxious to have a summary view of the total quantity of each and every kind of food used in your piggery per annum—the cost of raising or purchasing the food—the extent of and on which it is, or might be raised—the labor of feeding and attending at other times—the annual weight and value of the pork killed—the usual number and value of supernumerary pigs—the probable value of your farm, and the food consumed—and the quantity and quality of the manure saved or produced, as well as the cost of an equivalent in manure, if otherwise obtainable. I have, you see, some curiosity; but I persuade myself, that it cannot give one so systematic as yourself, any trouble to answer me on each of these points, and in a way to show me at a glance of the eye, that it is better for you to convert your vegetables and corn into pork and manure than sell vegetables; whilst I shall at the same time, be taught economy and method by your precept and example, which I will endeavor to observe, and imitate at my breeding establishment. I feel somewhat at a loss as to the manner of building my pens; and on the inclosed paper, you will see doubts exemplified in rough diagrams; your correction on these would particularly oblige me. It is my desire to build them in a long narrow shed, on one side of my barn yard; and to have at one end, cooking and vegetable apartments.

At your request, I am induced to ask whether it would not be better, that is to say, cheaper, to steam than to boil your vegetables? I have seen it stated in the explanations of Scotch implements, published by the Board of Agriculture, in the year 1814, that one person, by a simple apparatus, may steam in an hour, food enough, say of potatoes, to feed fifty horses a day, at 32 lbs. for each horse. And I had quite concluded to procure a boiler and steaming box from Scotland, on the strength of that statement.

I have been led to make some inquiries of you in this letter, from an attempt to push your proceedings to their results; as you will see by the enclosed estimates, which will best define the most of my inquiries.

Do you give the swill warm in summer as well as in winter? Do you spay your sow pigs, or put fattening sows to the boar, shortly previous to killing? Have you used the mangel wurtzel and observed its comparative value or relish? I think highly of it, and wish that it may be fairly tried by every farmer in this country. In our climate it is more certain and productive than any other root. On this head I beg leave, however, to refer you, for my opinions, to No. 5, vol. iii. of the American Farmer, in the notes on Mr. Cooper's account of his several crops. And I remain, truly, sir, your obliged and obedient servant,

JOHN SKINNER.

Nathaniel Ingersoll, Esq.

Estimate of Food, Fuel, Labor, &c. employed at Mr. Ingersoll's Piggery, per annum.

6 bushels of vegetables, roots, &c. three times per day=18 bushels per diem, for 365 days=to 6570 bushels per annum, which at 25 cts. per bush.=		$1,542 50
1 bushel of corn 3 times a day added to the above for 365 days, equals	1095 bu.	
13½ bushels or 3 quarts per day given to each of 144 fattening hogs, for three months or 90 days,	1215	
Corn per annum,	2310 bu.	
at 50 cents,		1155 00

Fuel 1½ cords per month, sawing, &c., 18 cords,		100 00
Labor one man and one boy, wages and board,		250 00
Yearly value bestowed on Piggery, Dr.		$3147 50
Cr. by Pork and Pigs sold.		
142 hogs at 280 lbs. 39, 760 lbs at 6 cts.	$2385 60	
24 pigs, one by each sow, at each farrow, over and above 9 suckled, $1,	24 00	
		2409 60
		$737 90

Showing a difference lost by using the food in the piggery, instead of marketing it, provided the corn and vegetables are valued at a price at which they could be marketed free of expense, and also return manure enough to keep up the fertility of the soil, which I presume might be done near this city, if not near Boston.

And if this is practicable near Boston would not the sale of vegetables and purchase of manure be attended with less care than the piggery, and be more certain? And at what price is the manure of stables to be had at Boston, say per load, of given cubic feet, when unrotted? And do your owners of market farms, who have been successful and long established, buy manure, and at what rate? An elucidation of my attempt to estimate your operations, will give me the marketable value of your vegetables at home and in Boston, as well as an idea of the expense of converting them into money by direct sale, all which will be very acceptable and useful to me personally, if you can find time conveniently to furnish it.

Estimate of Land and Labor required for the Piggery, &c. &c.

For 2,310 bushels corn for piggery, at 40 bushels per acre,	68 acres.
For 6,000 bushels vegetables, 500 bushels per acre,	14 acres.
Acres for piggery,	72
For the farm purpose to support 2 horses and 2 oxen, say grain and grass,	16 acres.
Pasturing, orchards, lots, &c.	12 acres.
Acres,	100

Labor required to cultivate 100 acres as above, say 2 hands, 12 months wages and board,	$300 00
For additional labor, spring, summer and fall, suppose to be equal to the expense of 6 hands for six months, or 3 for a year,	450 00
Annual labor, say	$750 00

A farm of 100 acres of first rate character might be worth $100 per acre,	$10,000 00

And the increase of value, attributable to augmenting population, would be more than equivalent to the wear and tear of utensils and stock employed.

The interest might therefore be considered as rent,	$600 00
Add for taxes,	25 00
And for labor as above,	750 00
	$1375 00
Then the farmer for his time may be considered as earning on a permanent scale, over and above interest, on his capital, by his piggery, for his own support, provided the manure keeps up the fertility of his soil, about	1034 60
	$2409 60

Brookline, Dec. 24th, 1835.

Dear Sir—I received your favor of the 21st ult., a long time after its date, and not until it was much worn and chafed with its travels ere it reached me. I will endeavor to answer your inquiries in detail. The following is a "summary view of the total quantity of each kind of food used in my piggery per annum," and the months in which they are used; beginning with the 1st of July, which is about the time I begin to depend upon summer vegetables, viz:

	bush.
July and August—Mangel wurtzel, roots, and tops being the thinnings from two squares each, containing 32 rods, -	800
Summer squashes - - - -	200
Early cabbages - - - - -	100
September, October and November—	
Winter squashes or pumpkins - -	700
Large drum head cabbages - -	800
Trimmings of mangel wurtzel turnips, &c. &c. - - - - - -	150
December, January, February, March, April—Mangel wurtzel,* (roots) -	200
Carrots - - - - - - -	900
Ruta baga, - - - - - -	200
Cabbages - - - - - -	1500
May—Parsnips which are left in the ground during the winter, and allowed to grow in the spring, until their tops are from 4 to 6 inches high, when they are daily dug as wanted, and all boiled - -	500
June—Potatoes, - - - - - -	250
Early lettuce, peas, chopped up vines and pods when the peas are full grown, though still green - - - -	250
Bushels, -	6550

We always mix the vegetables by boiling some of either kind in each kettle.

My farming, or rather gardening, goes upon the principle of cultivating but little ground, and by great attention to get large crops, and in some instances two from the same land. The form of one piece constantly in cultivation is an oblong, thus divided with an alley or walk 4 feet wide in the centre.

No. 1. Of the upper side was sowed this year with mangel wurtzel, thinned out several times as described in a former letter, and finally cabbage plants set out two feet apart, (for winter crop,) taken from square No. 3, of the lower side.

No. 2. Has now a crop of parsnips left to grow the next spring, to furnish food for the month of May. The frost, however severe, does not injure them, and they are very much liked by the hogs. The advantage of preserving without trouble through the winter makes them valuable.

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* Cabbages and mangel wurtzel used first.

No. 3. Upper side, produced parsnips that were dug in the month of May, and 4th of June was sowed with carrots. Produce 237 bushels of the short kind.

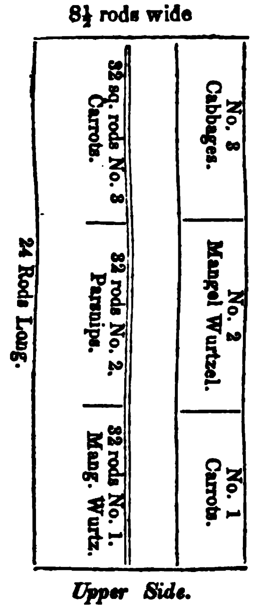
No. 1. Of the lower side was cropped with carrots this year; of the long orange kind. Produce 248 bushels.

No. 2. Bore the crop of mangel wurtzel I described to you in a former letter.

No. 3. Cabbages.—The ground was laid out in 8 beds, 4 rods long, and 1 wide; the 12th June, it was sowed with Pomfret cabbage seed, in rows 2 feet asunder. They were thinned out, as plants were wanted to set other places, so as finally to stand 2 feet apart. Produce 590 bushels.

This piece of land is constantly cropped in such routine that the same vegetable occupies the same square once in three years. Each square is annually manured with *well-rotted* hog dung, and always at the rate of 4 cart loads for 40 cubic feet. The cabbage square has in addition 20 bushels of unslacked wood ashes.

The aggregate produce this year of the whole 6 squares, or 1½ acres was as follows, viz:



Upper Side.

No. 1.	Mangel wurtzel tops and roots all boiled together	510 bush.	
	Cabbages transplanted	500 do.	
			1010 bush.
No. 2	Now filled with parsnips—no doubt		500 do.
No. 3.	Carrots		237 do.

Lower Side.

No. 1.	Carrots	248 do.
No. 2.	Mangel wurtzel	523 do.
No. 3.	Pomfret cabbages	500 do.
	Bushels	3028

Upon the borders of this garden ground, which is one rod wide, I have a row of fruit trees. Under them we have lettuce, early cabbages, ruta baga for transplanting, and such vegetables as our family require. But upon the plot above described nothing grows to shade the crops devoted to the piggery.

A second piece of ground, contains a square acre, and is divided into 4 equal parts and cropped in this manner, viz:

One-fourth acre, early potatoes and peas for family use. Of the peas, those not wanted, are chopped up, vines and all, and boiled in June. This land is cleared soon enough for a crop of transplanted Swedish turnips, or ruta baga.

One-fourth acre summer squash. Produce 200 bushels.

One-fourth acre, carrots. Produce 310 bushels.

One-fourth acre, cabbages. Produce 560 bushels.

These two pieces of land are my sheet anchor—they are highly cultivated and neatly dressed, without a weed allowed to seed upon them.

I annually cultivate, besides, 3 acres of field land, by breaking up 1½ acres, and laying down the same quantity. These 3 acres are cropped as follows, viz:

One acre potatoes,	250 to 300 bushels.	
One acre winter squash or pumpkins	700 to 900 bushels.	
One-half acre cabbages	1000 bushels.	
One-fourth acre mangel wurtzel	250	Roots, tops, &c. given to sheep and cows.
One-fourth acre carrots	250	
	2500 bushels.	

These crops are an average for the last 3 years. My whole farm, (if it deserves that name,) is only 21 acres, within a ring fence. Of which one acre or more is occupied by buildings, yards, and approaches to them.

To carry on all my operations I keep two hired men through the year, one of whom however, does the duty of house servant at the same time; and I hire besides day laborers and cattle to plough, to amount of 150 dollars more. It occupies about the whole time of one man, to take care of my stock, consisting of 160 hogs, 60 sheep, 1 chaise horse, 1 cart horse, and 1 cow; though they are both together, and when the animals are fed, are employed in the gardens in summer, and in winter getting out manure for the next season.

In answer to your question respecting the "probable marketable value of the vegetables on my farm," I would observe that the kinds and quantities of many which I raise, could not be sold at all; as for instance, the mangel wurtzel, ruta baga and all the tops and trimmings of others. Mr. Quincy tells me, he this year sells carrots in Boston, after carrying them 8 miles, at 9 dollars per ton, or 18 cents per bushel. Cabbages are sold by the load at 2 cents each, or about 8 or 10 cents per bushel. Parsnips and winter squashes must be retailed, and pumpkins in any quantities would not sell for any thing.

To answer your question about market gardeners, I have endeavored to recollect who among my neighbors have been successful and long established in that line, and I cannot select a single individual who has not driven his own cart to market, until he had sons old enough to take his place, and thus, by attending to the minutiæ of the business, prevented that fraud and deception, that a gentleman farmer cannot easily avoid. When I first bought my estate, I set up a market cart, got a stout horse, and a man well recommended; but my daily receipts kept growing less and less; my man and horse were out late every evening, and after a vexatious and mortifying experiment; I was convinced, that I must either find a market for my vegetables upon the place, and under my own eyes, or give it up as a losing concern; for I could not bring my mind to the constant and daily competition, for trifling sums, which a man habituated to it from infancy, rather takes pleasure in.

Manure bought in Boston, costs them two dollars per buck load, of 62 or 63 cubic feet, trod hard and moderately heaped, in its unrotted state. The expense of carting, put at the lowest rate, cannot cost the farmer less than $1 50 per load, and when they bring it on hire, they charge $2 50. My whole stock annually furnishes three hundred such loads, which after using all I want, find a ready sale among the market gardeners in my neighborhood at 3 dollars per load, they taking it away with their own teams.

This manure is without any mixture of pond mud, sods, &c. which, had I access to such materials, might be very profitably increased.

As it respects steaming, instead of boiling vegetables, the only expense saved is fuel, for the same labor is necessary in filling and discharging them. Our laboring people require to have their work simplified as much as possible, and their judgment not often called into exercise. Were I to tell my man to steam 18 bushels of vegetables, and to give one-third of them 3 times a day to the stock, the consequence would be, that a much greater quantity would be given at one time than another, and though the whole would be consumed in the course of the day, still the inequality of feeding would be hurtful. Besides in winter, particularly the swill must be very warm, which could not be at night with vegetables steamed in the morning. Upon the whole therefore, I prefer to say to him, "fill the kettle with vegetables, and after they are boiled away sufficiently to make room, put in one bushel of cracked corn and oats, and give the whole for breakfast," thus making out the exact line of duty, and leaving nothing to his discretion.

I give the swill warm in summer, and almost hot in winter, and always sweet and fresh. In conversation with Dr. Derby, he argued upon the propriety of feeding with sour food, and that cold. I have formerly tried it and satisfied myself it was wrong. Pigs may be habituated to eat it; but place this cold stuff in a trough, and a good smoking hot breakfast of mine in another beside it, and I will venture to say, they will soon show a preference.

I never spay sows, because *we have no one who knows the mode*, which is to be regretted. They are sometimes admitted to the boar a few weeks before killing.

In yours received yesterday, through Wells and Lilly, you ask my opinion of the Byfield breed of hogs. As breeders they are the worst I know. The sows have small litters and destroy them oftentimes by laying down without any care. They are long coarse haired animals and very apt to be mangy; nevertheless to mix with almost any other breed, a Byfield boar is valuable, being a quiet race, and disposed to get fat at an early age.

The Bedford is a hardier kind, and make good nurses. But for our uses have too much lean meat in proportion to their fat—their hams from that circumstance are excellent; a cross between a Byfield boar, and a Bedford sow furnishes a profitable and handsome stock.

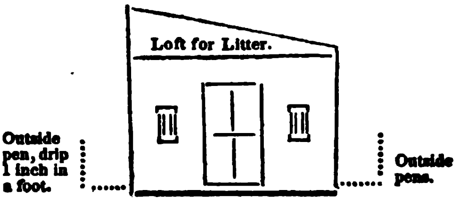
Inclosed is a sketch of my piggery. I thought it might assist you in determining the mode of building yours. I find mine convenient, and know not, that I could alter it advantageously.

I have thus, my dear sir, attempted to give a comprehensive answer to your interrogatories; if there is yet anything not perfectly clear to you I shall be happy to explain.

EXPLANATION [OF PLAN ON NEXT PAGE.]

1. Boilers.
2. Swill Trough.
3. Vegetable Bin.
4. Boiling House and Vegetable Bin.
5. Passage to feed.
6. Small pens for sows to pig in, in cold weather.
7. Passage to feed.
8. Grain Bin.
9. Outside pens for sows—4 feet by 7½.
10. Inside pens for sows—7½ feet long by 5 wide
11. Inside pens for store pigs—6 feet square.
12. Outside pens for store pigs—4 feet by 6.

a. Troughs.
b. Door.
c. Trough Door.

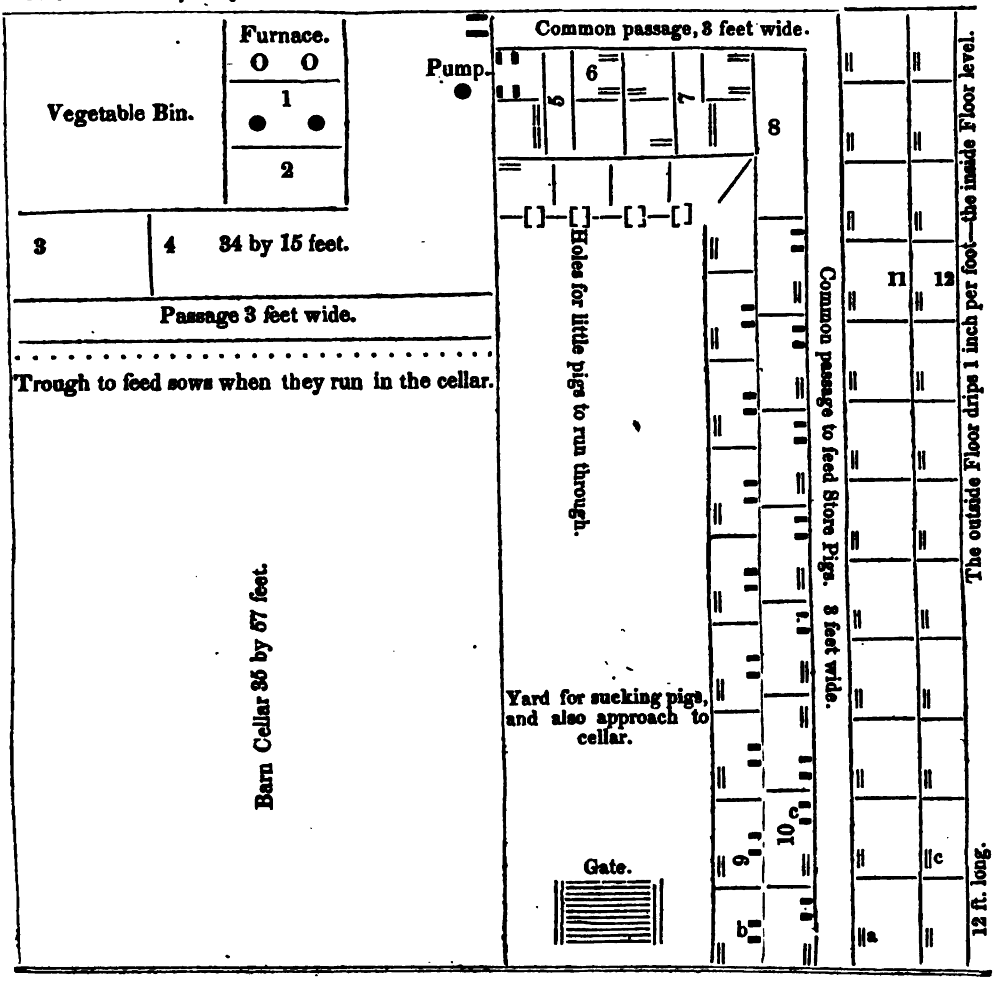


I have found it necessary to have communication with all the pens, from the principal *inside* passages for the facility of moving the sows and store pigs, because outside doors are apt to be frozen down in winter. The spaces at the ends of the troughs, are therefore sliding doors, as all others are. The four pens near the boiling house, are made tight with covers, for sows to farrow, in very severe weather. The hogs are all fed from the common passage, under cover. They eat more comfortable, and the troughs are never filled up with rain or snow. The outside pens of the sows, when they have pigs, are cleared into a cart, and the manure carted away, that the yard for sucking pigs may always be clean—and where they will soon learn to eat whole corn, if placed in shallow troughs. They have holes sufficiently large for them to run out of.

Since you were here, I have been obliged to new lay the floor of my piggery, and have now arranged the pens conformable to the above sketch. I have also dug a well in the boiling house, and have the nose of the pump placed high enough to carry water into the kettles. Should my spring fail, I shall by spouts, conduct the water that falls in rain upon the building, into the well. My fatting hogs, you will recollect, are fed upon the barn floor, and cleaned into the cellar, where the sows run before they pig.

NATHANIEL INGERSOLL.

J. S. SKINNER, ESQ.


Vegetable Bin.
Furnace.
1
2
Pump.
Common passage, 8 feet wide.
3
4
34 by 15 feet.
Passage 3 feet wide.
Trough to feed sows when they run in the cellar.
Barn Cellar 35 by 57 feet.
Holes for little pigs to run through.
5
6
7
8
Yard for sucking pigs, and also approach to cellar.
Gate.
9
10
a
b
c
Common passage to feed Store Pigs. 8 feet wide.
11
12
The outside Floor drips 1 inch per foot—the inside Floor level.
12 ft. long.

From the Farmers' Magazine.

REVIEW OF "ESSAYS ON THE NATURAL HISTORY AND ORIGIN OF PEAT MOSS"—*By the Reverend R. Rennie.*

Philosophers are not at one with regard to the nomenclature of soils. It is plain, however, so far as regards practical and useful purposes, that soils may be classed as clay, gravel, sand, and peat earth; and that to one or other of these soils, the numerous varieties to be found in the British isles are less or more allied, though the degree of affinity betwixt them is, in many cases, difficult to be ascertained. Loam has generally been treated of as an original soil, though we are disposed to view it as an artificial one, produced by the application of calcareous matter and animal and vegetable manures. Even peat earth may be converted into a soft black loam, and rendered fertile and productive by different processes; such as draining, liming, and mixing it with clay or any other soil, which has a stouter body, or contains a greater portion of vegetable substance. From these circumstances, a degree of confusion prevails respecting the nature and properties of several soils, which renders every description of them more abstruse than at first sight might be expected. Even the admixture of surface and substratum by deep ploughing, augments the confusion, and serves to produce a change in the original soil, of considerable magnitude.

It is only with one of the varieties of soil, however, which we at this time have any business, namely, peat earth, or moss; but when it is considered, that this variety forms the surface of at least one-sixth of Great Britain, the subject will appear of such importance as to call for the most minute and serious investigation. After all, we are not sure whether peat earth should be considered as a primary or original soil: we are rather disposed to view it as an artificial one, and produced by certain substances deposited on the surface of the earth. On these points philosophers are greatly at variance, entertaining such discordant opinions, that we are much inclined to think, few of them understand the nature and properties of moss, or are acquainted with its origin and history. By one we are told, that peat earth is a primitive soil, and of antediluvian origin. By another, that it is a kind of growing vegetable, or a plant *sui generis*, which continues to grow and increase to an immense magnitude and indefinite age, and may continue growing and increasing, till, like the lean kine of Pharoah, it swallows up and devours all other soils that are in its neighborhood. By a third, we are informed, that it proceeds from ligneous and aquatic plants, brought into action by the destruction of the immense forests which anciently abounded over all Europe. Our opinion leads us to adopt this hypothesis, because it is supported by the appearance which peat moss generally presents, and by facts which may be gathered concerning the former state and condition of the places where moss is now most predominant. It is indeed truly wonderful, that so little should be known upon a subject confessedly of the greatest importance, not only to the agriculturists of Britain, but also to those of the whole world. Under this impression, we examined the essays now under consideration with much anxiety, and can safely state, that few writers have treated of the origin of moss in a more luminous manner. The author (Mr. Rennie) seems to be free of prejudice, attentive to minute inquiry, and disposed to gather knowledge from every source within his reach, or which promised to yield the information he was in search of.

Mr. Rennie has presented us with two essays on this important subject. The first is on ligneous plants, wherein he shows, that forests abounded in the north of Europe two thousand years ago; and then points out the causes, or means, which brought about their destruction. In the second essay, he treats of aquatic plants as contributing to the formation of moss; and it must be acknowledged, that his deductions are in strict conformity with his premises. In short, we have perused many papers on peat earth, or moss, but from none of them have experienced so much satisfaction as from the essays of Mr. Rennie.

The tenth section of the second essay contains the author's general conclusions, all of which are clear, distinct, and well expressed. The first of these conclusions is, that moss is of vegetable origin. The second, that all moss is either composed of ligneous or aquatic plants; and the third is so much to our mind, as to encourage us to lay it before our readers.

'*Thirdly*, From the above account we may conclude, that many regions now covered deep with moss, were at one period arable lands, at another forests, at a third lakes.

'We may still trace these changes, and mark their progress, in many mosses. For instance,

'1. Under some mosses the marks of the plough, and even ears of corn and other grain, with various utensils of husbandry, have been found.

'These are clear evidences that, at one period, the above surface was a ploughed field.

'2. In these ridges a vast variety of trees are found, some standing erect, others fallen prostrate, but all with their roots fixed in this subsoil of arable land. This is a proof that, at a second and subsequent period, the surface was covered with a forest.

'3. These trees are sometimes found immersed in moss of a semi-liquid state, to the depth of 10, 20, or 30 feet; and aquatic plants, such as flourish in water, may be still traced through all its depth. Nothing can be a clearer proof than that this, at a third and subsequent period, has been a lake.

'And in this stage some lakes are still found. Lough Neagh is an instance of this. Mr. Smith, in his account of it, mentions, that part of this loch was formerly a forest; that this is the common tradition among the inhabitants of that district; that it is probable, for much wood is found in it; that this wood is sunk in a kind of pulpy moss called mire, black at the bottom of the lake. If so, it will naturally be asked, why the whole loch has not been converted into moss? It is impossible for me to assign the reason. Perhaps the great extent of the surface, and the agitation of the waters by the winds, may be unfavorable for the growth of those aquatic plants which contripute to form moss; or, perhaps, the petrifying quality of the waters may be unfavorable for this purpose. If the aquatic plants above described grow in any sheltered bays of this loch, and if they are there accumulated, they may ultimately be converted into moss. This I mention, merely to excite the attention of the intelligent part of the inhabitants of that district to the subject.

'4. It is certain that, in other places, many lakes have been, by the above means, filled up and converted into mosses.

'5. And it is equally certain that, at a subsequent period, these mosses, by consolidation, may have been converted into meadows, and afterwards into rich arable lands. Most of the fertile plains along the banks of rivers, in the north of Europe, are of this description; they, of course, generally lye on a subsoil of moss.

'So that it is probable that many of these have, in the course of ages, undergone all the above changes; from arable lands to forests, from forests to lakes, from lakes to mosses, from mosses to meadows, and from meadows to their original state of arable land; I call it their original state, but I think it probable that, before they were first cleared and cultivated, they were originally covered with wood.

'It is natural to suppose, that many low levels, covered with wood, have been converted into morasses. The trees, by falling into decay, and stemming the course of rivers, may have occasioned such a stagnation of water as to cause this change. It is equally natural to suppose, that such low levels may have been converted into deep lakes. The mouths of rivers may have been so stemmed, by accidents such as I have decribed, p. 51 and 52 of my first essay, as to raise the waters in the valley to a level above all the plants and trees that originally sprung up and flourished in it. If this valley was of small extent, and the lake formed in it favorable for the growth of aquatic plants, the whole waters may have been first covered over with a matting of these. By consolidation, and the continual accession of vegetable matter, the whole lake may have thus been converted into a moss.

'All those mosses which are deep, and contain trees, some standing erect and others prostrate on the original subsoil, and especially those which contain a rushy, reedy peat above these trees, and a black compact moss above this, seem to me to have undergone these changes; and the vast extent of mosses of this description over Europe, probably originated in this way. It were superfluous to enumerate instances of this. I shall only specify two; the first is Low Modena, which seems to have undergone all these changes; the second is the bog of Monela in Ireland, which seems to have been subjected to a similar succession. Ramazini describes the former; Carr, in his 'Stranger in Ireland,' delineates the latter.

'The stratification of the vicinity of Modena is somewhat singular. "The surface of the valley is now a rich arable field. At the depth of 14 feet below this, it is said that the rubbish and ruins of an ancient city were discovered. Paved streets, and pieces of mosaic work were found at this depth: below this the earth is solid, and seems not to have been moved: lower down is a loose, moist soil, mixed with vegetables; and, at the depth of 26 feet, entire trees, such as filberts, with nuts, and a great quantity of branches and leaves, have been dug up. At 28 feet deep, a stratum of soft chalk, mixed with shells, was discovered. This stratum is 11 feet thick. Below this, at the depth of 40 or 50 feet, there is to be found the soil of a low marshy country, full of sedge, reeds, shrubs, roots of trees, nuts, ears of corn, leaves of trees, branches, and boughs." He even describes the species of wood. He says, that oak, elm, walnut, ash, and willow may be distinguished. "Some of these trees are broken down, others stand still upright as they grew. Among these are found old Roman coins, marbles, stones squared and cut by the hands of men. Each tree is found on the soil most adapted to its production. The fir roots are fastened in the sand, the oak in the clay."

'The whole of this valley, he says, was a lake in the reign of Julius Cæsar. The surface is now drained and consolidated, and converted into arable land.

'It seems obvious to me, that this valley has undergone all the changes above described; at one period it has probably been arable land; hence the ears of corn, &c. which have been discovered: subsequent to this, it seems to have been overgrown with wood; hence, the trunks and roots of trees: this wood seems afterwards to have been converted into a morass; hence the sedges and reeds, &c. which are found: this morass seems to have been after this consolidated by alluvion; hence the stratum of soft chalk and shells.

'Above this, another generation of a forest seems to have sprung up; hence the other tier of branches and leaves of trees. This second generation seems to have undergone the same fate with the first; the moist soil mixed with vegetables above it, seems to be the remains of the marshy plants that must have sprung up after this forest was also converted into a morass.

'This morass seems again to have been consolidated, probably by alluvion; hence the stratum of solid earth: on this the city seems to have been built; hence the paved streets, &c.: the 14 feet above this seems to have been formed after the city was overwhelmed with some inundation.

'Whether the lake that existed on the spot at the age of Julius Cæsar was thus formed, it is impossible to decide. If so, however, the 14 feet of solid soil above this city, must have been formed since that period.

'That many low lying valleys in different parts of the world have undergone similar changes, is not only probable but certain. The mosses of Ireland exhibit similar proofs of this: in digging deep into these, recumbent forests upon forests are found, with a layer of earth between.

'This leads me to notice the other instance mentioned by Carr, in his 'Stranger in Ireland.' He says, "that the bog of Monela is not far from the bog of Allan: stumps of trees are still visible on the surface of the former; under these lies a stratum of turf 10 or 15 feet deep: under this, a tier of prostrate trees is discovered; beneath these another stratum of earth is found of considerable depth: and below this a great number of stumps of trees are found, standing erect as they grew. Thus, there is a succession of three distinct forests lying in ruins, one above the other."

'He says, "Some of these mosses have been perforated deeper than 50 feet: at the bottom of many of them, he observes, arable land has been discovered, bearing the marks of the plough, and formed into regular ridges."

'These fragments of the natural history of mosses, may furnish us with some faint ideas of their origin and formation. If we were to discover the hulk of a ship, or even a few beams, sunk in the ocean, we would be at no loss to say, that these were the remains of a wreck. The size of these beams might easily lead us to distinguish between the wreck of a frigate and a first-rate man of war. The state of preservation in which these are found, might give us some idea of the period at which the wreck happened.

'It is precisely so in examining the history and origin of peat mosses. The ruined forests found in these leave us no doubt that they have been partly formed of the wrecks of these. The size and species of trees lead us to conclude what must have been the age of the forest when it fell into ruins. The state of preservation of these trees, and the depth of soil formed above them, may give us some faint idea of the period at which they fell. The remains of aquatic plants, reeds, and rushes, &c. found above them, give us likewise an idea of the cause of their ruin; and the stratification of the soil exhibits a view of the changes it has undergone in the lapse of ages.'

In these essays, Mr. Rennie has only endeavored to ascertain the materials of which moss is composed, and to show how those materials have been accumulated together. But he promises, at an early period, to lay before the public a series of other essays, respecting the uses to which moss may be applied; a subject certainly deserving of the most sedulous investigation. If these future essays are written with the like spirit as animate those before us; if they are executed with similar judgment, and directed by practice, not by theoretical speculation, then we may expect to receive more satisfactory information about the nature and properties of moss, and the economical purposes to which it may be applied, than has hitherto been communicated by any other writer. N.

To the Editor of the Farmers' Register.

LEGISLATION FOR AGRICULTURE.

The whole attention of our legislative assemblies, both state and federal, is taken up to the entire exclusion of the agricultural interest of the country, an interest, in which every individual is more or less, directly or indirectly, concerned; for, if the farmers fail to make good crops, and can spare little or nothing for market, after laying up a sufficiency for home consumption; what is to enable them to buy goods of the merchant, to pay the doctor's bill, the mechanic, &c.: and from whence will the merchant, the lawyer, the doctor, the artizan, manufacturer and mechanic, derive their supplies; how are they to get their bread-stuffs, beef, pork, bacon, and indeed almost every thing else upon which they subsist, if the farmers fail to make it for market? There is no class of people among us, that are not more or less affected by the prosperity or adversity of the agricultural community; and yet how little is thought of legislative aid, to foster and advance the interest of this important science and branch of industry. We are expending, and likely to expend, millions in internal improvements, and useless and angry debates, upon subjects of less importance, in my humble opinion, than agriculture, whilst that subject is lost sight of, as one of minor importance. I would not be understood as being opposed to internal improvements; but I would say, the greater the agricultural improvements and productions of the country are, the greater necessity will there be for internal improvements, and the better condition will the country be in, to pay for them. I do hope the legislature of our state, now in session, will look around and reflect upon the unprosperous and neglected agricultural condition of our country. If a proper regard and due consideration is given to the importance of the subject, that body cannot adjourn, I think, and the members go home, and say they have discharged their duty to themselves and their constituents, without doing something, at least, as an entering-wedge, to encourage and promote the science. Some of our sister states are aroused to the importance of their agricultural interest, and their legislatures turning their attention to its encouragement and promotion; nothing would be more gratifying to me, than to see our legislature doing its duty in looking to this subject. We have some few good scientific farmers among us, and although the number, comparatively speaking, is small, yet, if their services were brought fully to bear under proper legislative enactments, great good might, and no doubt would, result to the community at large. You have, upon many occasions, raised your patriotic voice in favor of legislative aid upon this subject, but it seems your good counsel has only been read and heard. The people must arouse from their lethargy, and speak out upon this subject, let their representatives know their wishes and what they expect at their hands; then, perhaps, they will pause and reflect, and begin to do something. I should like to see an agricultural school established, with able professors, to be located upon a pattern farm, purchased and kept up by state authority. I think incalculable benefit would accrue from such an institution. The Smithson bequest to the U. S. of £100,000, received some months past, is subject to be disposed of by the present congress. Can a better disposition of it be made, than to establish a national agricultural school, provided it can be applied in that way, consistently with the will of the liberal donor? P. T. SPRATLEY.

Surry County, Jan'y 17th, 1839.

To the Editor of the Farmers' Register.

PROGRESS OF DR. PERRINE'S SCHEME OF INTRODUCING TROPICAL PLANTS. LETTER OF CHIEF JUSTICE MARSHALL.

Indian Key, Tropical Florida, Jan'y 1, 1839.

Dear Sir:—After the delays and disasters, incident to human enterprise, myself and family reached this port, in safety, on the 25th December last: a detention of two months in the city of New York, being one of the penalties of seeking a vessel, the brig Lucinda, bound direct to Indian Key. Notwithstanding the ravages of the September gale, when the spray of the sea swept over this islet of twelve acres, I found my tropical plants more vigorous and flourishing than could be expected, from the circumstances under which they exist. They were generally planted in small boxes, not averaging more than eighteen inches long, by ten wide, and eight deep; yet some of them now support shrubs, or young trees, from eight to twelve feet high, with trunks of six to ten inches in circumference, which sprang from seeds planted in August, 1837.

A most beautiful leguminous tree the *serbania grandiflora*, now covered with its enormously large white papilonaceous flowers, has a stem of ten inches circumference and ten feet in height. In another box are *two* plants of the ——————* of five and seven inches in circumference, and of seven and eight feet in height. The earth in which they are planted is solely carbonate of lime, colored by vegetable mould. By the by, you may be aware of the fact that we have no other element [of soil] than lime along the whole Florida reef, and on all the islands from the Tortugas to Cape Florida. It appears principally in the shape of coral rock and calcareous powder, so that what is termed *sand*, should in reality be called coral powder, shell powder, &c., not a particle of silex or siliceous sand being found south of Cape Florida.

Avoiding further digression, I proceed to state, that as the savages will not permit our proceeding to the main land, the trustees of the Tropical Plant Company have decided to locate the preparatory nursery on the adjacent island of Matacumba, (which is four or five miles long,) and the clearing has already commenced; and as fast as the worthless indigenous plants shall be removed, the valuable vegetables of the tropics shall take their place. I have brought with me all the *seeds* of useful and ornamental plants which I could collect during the past summer in the green-houses and drug stores of the north; but the great task of transplanting *living plants* cannot be successfully accomplished until vessels shall run *direct* from northern ports to Indian Key. We had great expectations of receiving very valuable plants from the collections in Charleston, S. C. by the monthly mail-schooner from that port to this; but, at this very period when it was most essential to our success, the mail has been suddenly and entirely discontinued. It is, however, stated, that this post-office will hereafter be supplied with letters twice a month by the semi-monthly packet which sails from New York, via Key West to Saint Marks; yet, unless it be arranged that the same vessel shall also touch at Indian Key, we shall be entirely dependent on casual opportunities of intercourse direct. Under the hope, however, that the post-master-general will direct the semi-monthly packet to proceed *via Indian Key* and Key West to Saint Marks, we shall have ground enough prepared to *transplant* all the valuable vegetables from the green-houses of the northern states and of Europe which may thus be obtained through and from the commercial emporium during the ensuing months, and prior to the summer rains of tropical Florida. During this interval, I again respectfully solicit all easy aid to the tropical nursery which can be rendered through the facilities afforded for the transmission of seeds by the commissioner of the patent office. The trustees are able and willing to return ample equivalents for every seed, cutting, bulb, &c. of useful plants, which may be transmitted to them through the patent office before the first of June next. It is ardently to be desired that the bill to establish an agricultural department in the patent office will be speedily passed into a law; and that it will multiply a hundred fold the facilities for collecting and diffusing valuable plants throughout every district of our valuable country. If a thousandth part of the weight of the political newspapers carried by the mail to the most distant sections of the United States were substituted by an equal weight and bulk of useful seeds and plants, for distribution, it would be a million-fold more beneficial to all ranks and parties of our common country.

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* A botanical name, totally illegible. If some of our most intelligent correspondents could but see the manuscripts of others, (as no one can judge fairly of his own hand-writing,) they would commiserate the condition of those who have to decypher them, or to guess at the writers' meaning, and are held accountable for all errors. Instead of each one of these correspondents complaining of occasional mistakes of undecypherable words of his own letters, he would be surprised at the general accuracy of the interpretations of such hieroglyphics.—ED. FAR. REG.

I am pleased to see the stand you have taken in opposition to the epidemic humbug of speculative sales of the silk mulberry tree. The greatest natural importance of the propagation of the mulberry trees consists in the fact that they are naturally adapted to propagate themselves in the poorest soil; and hence their value is infinitely diminished by the artificial process of forcing their multiplication for trading speculation. On this barren coral rock, Charles Howe, Esq. has thousands of the morus multiculis of the hardiest habits, yet he has refused to answer a letter of the speculator of the north from whom he bought his original cuttings, and who now wishes to speculate on their progeny. Very respectfully, your ob'dt serv't

HENRY PERRINE.

P. S. In looking over my papers I found the letters of Col. White and of Chief Justice Marshall, of which copies are appended for publication in the Register, if you think proper.

Washington, May 29th, 1832.

Dear Sir,—It may be gratifying to you to have a copy of a letter I have just received from Chief Justice Marshall, on the subject of your project. It must be highly flattering to the ambition of any man to have the commendation of such a distinguished and illustrious man.

I am, sincerely yours, JOS. S. M. WHITE.

Dr. H. Perrine.

Richmond, May 24, 1831.

Dear Sir,—The report of the committee of agriculture on the memorial of Dr. Perrine, to which I am indebted to your politeness, was received on my return from the court at Raleigh. I have read it with deep interest. If the growth of the tropics can be transplanted advantageously to Florida, the culture must be extremely profitable to that part of the union, and consequently desirable to the whole United States. The sisal hemp in particular, appears to be among the most valuable productions of nature. The description of its qualities may be exaggerated, still the experiment ought to be made. I trust the application of Dr. Perrine may be successful. I thank you for this mark of your recollection, and am, with great respect and esteem,

Your ob'dt,

J. MARSHALL.

We should be gratified to receive from Dr. Perrine a full and particular description of this little speck of our territory, of which the existence, as an inhabited place, is known to so few, and its character, in soil, climate, &c. is so very different from all the main land. Much of our own studies and investigations have been devoted to the characteristics of soils, caused either by the deficiency or abundance, or by the various proportions, of calcareous ingredients. But though some of the prairie soils in Alabama, of which we have heretofore reported the constituent parts, are *principally* composed of carbonate of lime, we have never yet known a soil so exclusively formed of that earth as it would seem is the case with the soil of this islet, judging from its original construction, (by the labors of coral insects,) as well as from Dr. Perrine's statement. It is desirable to know, from actual analysis, how small is the amount of all other ingredients of the soil; and what are the peculiar, or most favored products, of soil so exclusively calcareous. We should fear for the safety of Dr. Perrine's exotics in so peculiarly constituted a soil. The growth of mulberry trees on such a soil, though nothing is said as to the degree of their luxuriance, is alone enough to confirm the opinion which we had before entertained, and expressed, that this tree requires a highly calcareous soil; and though it will grow tolerably well on soils very deficient in this character, yet that its greatest vigor and growth can only be seen where lime has been abundantly furnished to the soil, by nature or by art.—ED. FAR. REG.

RANDOLPH'S TREATISE ON GARDENING.

[The following little work deserves the place which will here be given to it, not only for the value of its instructions—which, to their extent, are even now the best known for the region for which it was designed—but also as a literary curiosity, it being the oldest Virginian work on cultivation, of any kind. The author was John Randolph, of Williamsburg, attorney general under the colonial government. The date of the work is not shown by any thing in the oldest edition which we have seen, which is as late as 1794.

The value of this unpretending little treatise has been so generally acknowledged, that it has passed through several editions. Still it is a scarce work, as must be soon the case with any which is of such small bulk, and published alone. The latest edition has many modern additions; but, besides other reasons for omitting these, we prefer to give the work to the public in its original form; which was without the name of the author, or without any introduction whatever to the notice, or recommendation to the favor of the public. It will be published altogether in this, the January number of the Farmers' Register, for more convenient reference and use.—Ed. Far. Reg.]

A TREATISE ON GARDENING.

Artichokes, known to the botanical writers by the name of *cinara*, are to be propagated either from the seed, which are to be gathered from the choke or flower at the head of the artichoke, or from slips, which are to be separated from the main stalk by the edge of the hand, and transplanted. If these offsets are good, they will be of a whitish color about the heel, and will have some little root to them. If you have plenty of ground, put three slips in a hill, and let the hills be four feet asunder, and the rows the same; but if you are scanty with regard to your land, you must cut your coat according to your cloth. About March, or the beginning of April, you are annually to slip off all the lateral branches with your hand, and leave only the three principal stalks in your hill. Every spring they ought to be dunged; sheep's dung and ashes are not only the best for that purpose, but also for preparing your ground for them. If you have depth of mould enough, i. e. two feet, and you don't crop your ground with any thing else, your artichokes will remain good a number of years; but if they are any ways neglected, or the ground is tended, they will not only be injured in their growth, but will very much degenerate in five years. When planted out, they should be well watered if not in a wet season, and kept clean from weeds. There are various methods of preserving them from the severity of winter. Some cut them down within a *foot* and cover them with a hill or ridge, leaving a small hole at the top which is covered with dung, others cover them entirely with dung. I have found from many years experience that long dung is an enemy to them, and that the best way to preserve them is by laying straw on the surface of the ground over their roots. This preserves the leaves from rotting, which fall down from the frost, and united, afford such a protection to the plants, that not one in fifty will perish. They never flourish in a dripping situation, but like a low place not too wet, but very rich. When you cut them, cut the stalk quite down to the ground, which strengthens the plants and makes them forwarder in the spring. There will be many on a stalk, but all must be pulled off except that which is on the centre of the main stalk, if you propose having them fine. If you prick out the slips in the spring, you may have a succession till the fall. The leaves of artichokes, I have been informed, clean pewter the best of any thing. There are different sorts, but two only that are much propagated. 1st., *folus aculeatis*, i. e. prickly leaves; 2d., *Folus non aculeatis capite subrubente*, i. e. without prickly leaves, smooth and reddish heads. The latter is most preferred. There is the *Cinara spinosa*, which is to be cultivated and eat like celery, which produces a head with the seed not unlike the artichoke, from whence it took its name. The common name is chardoon or cardoon. The Jerusalem artichoke, *helianthus*, is only a species of the sun flower with a tuberous root, not unlike a potato. Some admire them, but they are of a flatulent nature and are apt to cause commotions in the belly.

Asparagus, (*growth a young shoot,*) are to be propagated either from the seed or roots. The seed are contained in those things which look like red berries. These are to be gathered from the most flourishing stalks, and laid in a tub for about three weeks to ferment. This will rot the husks, which will swim upon being rubbed between the hands and having water poured upon them, but the seed will go to the bottom. Pour the water off gently, and the husks will be carried along with it. This being done two or three times, the seed will become perfectly clean. They are then to be laid on a mat or dish, and exposed to the sun to dry. When that is done, they may be put into a bag, and pricked out in February or March, in beds about a foot asunder every way, and never to be transplanted. But if they are to be transplanted, they may be sown as thick as you do cabbage. If you propagate from the roots, those of a year old are most eligible, though if two, they will succeed very well. In planting them out, they should be placed about four inches under the surface of the ground, with the bud erect against the side of the earth perpendicularly cut, so that the extremities of each root may touch one another. This will put them about a foot asunder. The best time for transplanting them is when they begin to shoot, but before they appear above ground. The principal thing to be regarded with these plants, is the bed in which they are to be placed. A great apparatus was formerly made use of, but now seems on all hands to be disregarded. Nothing more is necessary than to make your beds perfectly rich, and light, that the head may not be obstructed in its growth upwards. Two feet of mould and dung is depth sufficient for any plant. They are to be kept clean from weeds, and nothing sown upon the beds. The fourth year from the seed they may be cut moderately, but it is better to wait till the fifth. About October, the haulm should be cut down and the beds covered with rotten dung about six inches, part of which may be taken off in February or March, and the remainder forked up in the beds, which will not only assist the roots but raise the beds in some small degree yearly, which is an advantage. A spade is a very prejudicial instrument to them. Cut with a blunt pointed knife (some use a *saw*) and separate the earth from the plant and cut it so as not to endanger the head of another that may be shooting up. There are joints in the roots of the *sparrow* grass like the wire grass, from every one of which a head is produced. Butchers' dung is what it delights in. I would recommend your beds to be about four feet wide, that the grass may be cut without treading on the beds, which often hardens the earth so much that the grass can't come up, and must of course perish. In these beds I would have three rows, for the roots ought to have a sufficient quantity of earth on all sides. Beds thus managed, Miller says, will last ten or twelve years, Bradley 20, and I am inclined to join with the latter.

BEANS, (*faba fagein, gr. to eat,*) delights in a fine rich stiff soil, without dung, though that must be supplied where the lands are poor. To have fine beans, especially the Windsor sort, which is much the best, they ought to be planted six inches asunder, in rows three feet distant from one another, in the wane of the moon (as it is vulgarly said) and under a hedge which serves for a shelter. When the flowers begin to open towards the bottom of the stalk, the tops should be pinched off; though it is as good a season as any to do it in, when the blossoms are well blown and set. If you want an early crop, plant in October and hill them up as they grow, and shelter them; if a second crop, cut them down within 2 or 3 inches of the ground before they bear fruit. Dont pull the bean, cut it with a knife. The first production is the properest of all seeds for sowing. When the seed is ripe, you must pull up the stalks and sun them, observing to turn them every day or two. Beans, like all other seed, degenerate in the same ground, wherefore, 'tis advisable to change your seed, and the beds they grow in.

KIDNEY BEAN, *Phaseolus, Phaselos, (great or long swift ship,* which the husk resembles,) may be planted in March; if sooner, they must be well sheltered, (for they are easily *killed*,) in a light fertile soil, in trenches about two feet and a half asunder, each grain two inches distant from one another, and one inch deep. They will not bear transplanting. They should be planted in a dry season. The Dutch sort, which is the common kind, should be stuck, otherwise they lie on the ground and rot. This sort, if stuck, grow to a great height and afford a constant succession. A second sowing will supply you sufficiently the season. If, when you plant, it should be a dry season, water the furrows or trenches before you drop the seed in. French beans and snaps are the same. The Dutch sort are not so apt to be stringy, which the dwarf sort are.

BUSHEL or SUGAR BEANS, being of a tender nature, should not be planted till April, which is the best season, in hills made light and rich, about three to the hill, so as to admit a stake in the middle of them. They will grow round the stake to a great height, will bear very profusely, and continue till destroyed by frost. They are esteemed very delicate, and are of various colors, as white, marbled and green, &c.

CABBAGE, &c.—Under *brassica* is included all the several species of the cabbage, among which cauliflowers and brocoli are classed. The proper time for sowing the seed of brocoli is in the latter end of May, and transplant them into beds when they have eight leaves, and plant them out about the latter end of July, in a place well sheltered, not under the drip of trees, in a soil rather light than otherwise. About December, it is said, they will have purple heads, which are eaten, though I myself could never make them head before March. The distance these require is about two feet every way, though more would do better, if there is plenty of ground. The Roman brocoli is the proper sort to cultivate, otherwise called the Italian brocoli. When you cut the flowers or heads, cut to about five or six inches of the stem, and before they are boiled, strip off the skin, and after having washed them, boil them in a clean cloth and serve them up with butter, as cauliflowers are. The stems will eat like asparagus and the heads like cauliflowers.

The common WHITE CABBAGE, *capitata alba*, is the proper sort for winter. It is long sided and flat. The seeds should be sown in April or March, and if they should grow long shanked, they should be pricked out until the middle of May, when they are to be transplanted to stand at about two feet and a half distant from one another, and three and a half row from row. Three things are necessary to cabbages as well as other vegetables; to be watered in a dry season, hilled up if they grow long shanked, and kept clear of weeds, which draw the nourishment from the plants and make them spindle. In November, take up your cabbages by the roots, and plant them under a ridge of earth with the tops of their heads to the south, covering the stem entirely, and this will protect them the whole winter. If they are hard and compact when thus placed out, they will be sufficiently protected; and though the outside leaves may be affected by the frost, yet the hearts will remain entire.

The SAVOY CABBAGES, which are esteemed best when pinched by the frost, are to be treated in the same manner as the white, only they may be planted nearer one another, not being a long sort.

The BATTERSEA CABBAGE is the earliest of all, and head in a short time, and burst if not cut soon.

But the SUGAR LOAF, which is the finest, will remain a considerable time. These should be sown every month, and transplanted every season.

The BORECOLE, is treated like the white cabbage and need not be above a foot asunder. These are tough till the frost has made them tender.

There is a cabbage which is called the RUSSIA kind. They are very small, and soon degenerate, if the seed is not changed.

There's a TURNIP CABBAGE, which being very strong is fit only for soup.

The seed of the CURLED COLEWORT are to be sown in July, about twelve inches asunder.

There is a MUSK CABBAGE, *moschumoleus*, remarkable for its tasting like musk, and is to be treated in the common manner. I have met with these in Virginia; but Miller says they are not propagated much in England, though the most delicious.

The common COLEWORTS, should be sown the beginning of July and transplanted. There is a perennial colewort, which will in poor land remain four years, but in rich not above two, before they go to seed. In order to save the seed of cabbage, they should be taken out of the ground in November, and put under a hedge or other sheltered place, buried up to the middle of the cabbage, and in the spring they will begin to sprout and produce their seed. If the season should be dry, they should be assisted with moisture, and the stems should be supported. When the pods begin to be brown, cut off the extreme part of every branch or shoot. When your seeds are ripe they should be cut off and thrashed out, when dry, and put into bags. By planting the several sorts of cabbages together, as white and red, &c. there is a commixture of the effluvia of each, and each are vitiated, which is the reason, Miller imagines, why seed so soon degenerates in gardens, as gardeners are either negligent or unskilful in this particular, too generally.

Cauliflowers must be sown critically to a day, or else there is no dependence on the success of them. I cannot, nor do I find any one else capable of assigning a good reason for this, but the experience of this country, as well as England, verifies the proposition. We must therefore receive this fact as we do many others, rest ourselves satisfied that the thing certainly exists, though the mode of existence is an impenetrable secret to us. Miller says, that for spring cauliflowers the seed should be sown on the tenth or twelfth of August; but in Virginia the twelfth day of September is the proper time, which is much the same as in England, allowing for the difference of climate, the ratio of which ought to be a month sooner in the spring, and the same later in the fall; our summer months being so intensely hot in this place, they should continue until the 20th of October, where they are to remain all the winter protected from the inclemency of the weather; and towards the latter end of February, the plants shouldbe drawn, and planted in a good spot of ground for a crop, about three feet and a half asunder, Miller says; but I think six much better, on account of the earth it takes to hill them up when rampant. Gardeners are divided with regard to the manner of preserving them in winter and after they are planted out in February. Glasses are generally mentioned in the books of gardening, as most proper; but latter experience seems to contradict this position, because they make the plant spindle, which is to be feared and guarded against in cauliflowers, as they have a natural tendency towards luxuriancy; and therefore it is said that boxes, pyramidically formed, answer the purpose much better, for they equally protect the plants from frost, afford them full room to germinate, and at the same time do not draw them to such an inordinate length as glasses are apt to do, even with the best management. In order to have cauliflowers in the fall, you should sow your seed on the twelfth day of April, and transplant them into beds to restrain their growth, and in July fix them out to stand. As they grow they should be hilled up, otherwise, when they head, the winds will be apt to injure them. A rich light soil is what they delight in most. Col. Turner, of King George, who was eminent for cauliflowers, had a method peculiar to himself, for some years, of managing them, which succeeded beyond any other. He dug trenches about a foot and a half wide, quite down to the clay. With this, he mixed with a spade some long dung, into which he put his plants about five feet asunder, when they were fit to be transplanted; and as they grew, hilled them up with the best mould. This method answered the purpose of transplantation, for the clay repressed the growth of the plant, and the warmth of the dung afforded them just heat enough to live by, as they might without it perish for want of nourishment. I have found myself this method succeed the best. Virgin mould is preferable to every other sort. The gardeners near London have wholly abandoned the practice of watering their cauliflower plants in the summer, as a thing very injurious to them; and Mr. Miller coincides in opinion with them. Radishes or spinach sown among the cauliflowers, so as not to interfere with them, will preserve them from the fly, being a more agreeable food to that destructive animal. When your cauliflowers begin to flower, the inner leaves should be broke over them, otherwise the sun will soil their snowy color; and as they spread, the larger leaves should be served in the same manner. Some pin the outer leaves with a stick; but this is a malpractice, because it often binds the flower, so that it cannot grow to that size it otherwise might do. In November, when you have apprehensions as to the approach of intense frosts, take your cauliflowers up by the roots, in a morning, with as much mould as you can, and put them in the ground, in a hole dug about two feet below the surface, well sheltered by straw or thatching, as near one another as you please, and cut them as you have occasion. They may be preserved in this manner the greatest part of the winter, though they acquire an earthy taste from their confined situation. They are not so delicate in the winter, or fall, as they are in May; notwithstanding in May they are in the midst of other elegancies, and stand without any rival in the fall. That face must be fair indeed that shines amongst a multitude of beauties, which too often eclipse one another. When you meet with a cauliflower whose curd is hard and white, and free from frothiness about the edges, let it stand for seed; and as the flower branches, remove the leaves from off it, and fix three pretty strong stalks at equal angles about it, surrounded with pack-thread in order to support the branches, which might be otherwise broke by the wind. When the seed are ripe cut the pods off and dry them, and rub them out as you do cabbage seed. I have been told that seeds cannot be raised in this country, but I believe the contrary may be proved by a proper culture.

Carrots, *Daucus*, (from *daio*, *gr*. to burn, from the hot taste,) are of two sorts, the orange and white, the former being generally used, though the latter is much the sweetest kind. To have them fine in the spring, sow them in drills about two feet distance, for the convenience of weeding them, about the latter end of August; and when they appear, draw them, so as to keep them about four inches asunder, and in February sow again for the summer, and in April for the fall. They choose a light warm soil, and should never be dunged with long dung, nay it is thought best to dung the ground the year before; for when they touch dung or meet with obstruction, they fork immediately. The seed should be rubbed before sown, to get rid of the husk to which they adhere. It should be sown in a calm day, as the seeds are very light and easily blown away. They should be trod down when sown, and raked smoothly over. When your carrots appear heady above ground, they should be trod, that they may grow more below than above. In November take up your roots and put them in dry sand, and you may use them as occasion requires. About the middle of February plant out one of the most flourishing for seed, which when ripe, dry in the sun and rub out.

Celery, *Apium*, (*quod apes eo gaudeant*, or from *Apex*, because the ancients made crowns of it,) is one of the species of parsley. At first I was surprised to find this, but upon examining the two plants there is in many particulars a characteristical likeness. Celery is the *Apium dulce*, *Celeri Italorum*, the seed of which should be sown in a successive manner to have it fine for any time, for after it is blanched it will not remain good longer than three weeks, or a month, but will rot or grow pipy. Let the first sowing then be in March, the second about a fortnight after, i. e. the last of March, the third in the beginning of April, and the fourth about the beginning of May. In about three weeks or a month, the seed will come up, and if your plants grow stout, as probably they will in good land, you must transplant them into beds, and in June those of the first sowing will be fit to put out for blanching, and the rest should be also put out as they appear strong enough to sustain a removal. When they are transplanted for fruit, dig a trench by a line about ten inches wide and eight or nine deep, loosening the earth at the bottom and levelling it; and the earth taken out of the trenches should be laid on the sides for the convenience of earthing. These trenches should be about three feet asunder, and the plants should stand six inches distant from one another, in a straight row, cutting off the tops of the plants, when planted out. As the plants grow up, they should be carefully earthed up in a dry season, else they will rot, not above the crown or heart of the plant, and in a light rich soil, they will grow to twenty inches in height, but in poor land will not exceed ten. Your first plantation should be in a moist soil, but not the latter, because the additional wet of the winter will rot your plants. The sun is a great enemy to celery, when it is very hot, wherefore I would recommend the covering of your plants with brush at all seasons of their growth whilst the weather is hot, from nine in the morning till six o'clock in the evening. When you desire to raise seed, draw one or more of your flourishing plants, and plant it out in the spring, let it be supported against the winds, and in August the seed will be ripe, which should be then cut up, dried, beat out and preserved in bags.

Celeriac, *Apium dulce degener*, *radice rapacea*, (*Turnip-rooted*,) is to be treated much in the same manner as celery, except that the drills of these should be shallower, as this plant does not exceed ten inches in height, and requires but one earthing. The excellence of this consists in the size of its root, which is often as large as turnips. In summer, water your plants, if the season is dry; and in winter cover them with haulm, or any open covering, to protect them from frosts.

Parsley, *Apium hortense*, *seu petroselinum*, *vulgo*, if intended for the table, should be sown in drills pretty thick, in light rich land, but if for medicinal use, (the roots being prescribed on many occasions,) the seed should be sown thin, and the plants drawn and treated as is directed in the culture of carrots. Where you breed rabbits, it may be sown in the fields; hares and rabbits being remarkably fond of it, will resort to it from great distances. It is a sovereign remedy to preserve sheep from the rot by feeding twice a week on this herb, about two hours each time. If intended for the table, the seed should be sown early in the spring; if for medicinal purpose and rabbits, about the latter end of February in England, but about the middle of March in Virginia. The gardeners have an adage as to this plant, that the "seed goes nine times to the devil before it comes up," alluding to the length of time it lies in the ground before it germinates, which is generally six weeks. In this it resembles celery, as also in its foliage, and the head where the seed is produced. There are several kinds of parsley, but these I have mentioned seem the most useful and particular.

Cucumber, *Cucumis*, from *Curvatura*, abounding, because this plant is very pliable and crooked, is esteemed in its season the most refreshing and delicate of all vegetables, there are three sorts; 1st. *Cucumis sativus vulgaris*, *malmo fructu subleteo*. 2d. *Cucumis fructu albo*, the white cucumber. 3d. *Cucumis oblongus*. The first is the common sort most in use, amongst which there are differences in the size, length, &c. The second is cultivated in Holland chiefly, and the last sort is cultivated only in curious gardens, and are remarkable for their length and fewness of seed. As there are three sorts, so there are three seasons for cucumbers; the first is early, in hot-beds, the second is the middle crop, under glasses, and the third is for pickling. Although many are ambitious of having early fruit, yet it is certain that cucumbers are not wholesome till the hot weather comes on, for being pent up in hot beds, they inspire a confined watery air, which must necessarily make the plant crude and unhealthful. Towards the latter end of January, if you require cucumbers in April, you are to get about two loads of long dung, which will be sufficient for a moderate family, and mixing it with some sea-coal ashes, you are to lay it in a heap about three feet thick. In about four or five days the dung will begin to heat, and then you must take off part of the top, laying it flat on the sides of your heap, and put on about two inches of good earth, which must be covered with your glasses. In a day or two after when you find the earth pretty warm, put your seeds in the earth about a quarter of an inch deep, and keep it close covered with the glass all night and in bad weather, and the glass should be also covered with mat. In three or four days, the plants will appear, upon which you are to make a bed for a single light on the adjoining heap of dung, covering the top about three inches thick with mould, into which you are to put your plants, at about two inches distance each way, observing to put them into the earth almost up to their seed leaves. In 24 hours your plant will take root, and you are to give it what air you can without injury, turning the glass upside down in the heat of the day, or wiping off the water that it condensed in the upper part, and is very pernicious when it drops on your plants. You are to water your plants, though moderately, and your water should be as near the temperature of the air in which plant exists, as possible and as the plants advance, support their shanks with a little dry sifted earth, which will much assist them. If your heat is too intense run a stick into the middle of the dung, through the sides of the heap in two or three places, which will give vent to the steam. If it be too slack, cover the sides of your heap with more litter. When the 3d or rough leaf appears, you are to prepare another heap, in which you are to make holes about a foot deep and eight or nine inches over, which are to be filled with light fresh earth, and in these, in four or five days, you transplant your plants, observing to water them as before, and to put four plants into each, with their roots sloping toward the centre, lest they should get to the dung and be injured by it. You should avoid keeping your glasses too close, for the steam may cause such a damp as will very much injure the plants. Your plants tending upwards when they are four or five inches high, should be forked down, and when you weed them, hold the leaves very gently with one hand and weed them with the other. Pulling off the male blossom is not recommended, neither is pruning the vines; but if your glasses are filled with too much vine, you ought to draw out one of the plants, provided it is not matted with those you intend to stand. Whenever your bed loses its heat in any degree, it ought to be repaired; and though the plant delights in heat, yet you must cover your glasses when the sun is in the meridian, and hot. In watering these beds, you must throw the water all over the vines, but not in the heat of the day, for the drops will collect the rays of the sun to a focus, blister and ruin the plants. And as at this season you have often cold nights, you should preserve the heat of the beds; and from this management your cucumbers will last till the beginning of July, when your second crop will come to bear. The management of the second crop is pretty much the same with the former, only you must raise your glasses oftener as the weather will be warmer, and your seeds are to be put into the ground in March or April. Miller directs that beds of dung should be made for the second crop as well as the first, and the same culture observed, but I believe if your seeds are sown in April in rich light hills and sheltered from the cold with glasses, it will answer just as well, provided you keep them free from weeds, and watered with temperate water. Most people are fond of gathering their seed from the first early fruit, leaving one cucumber only on a vine, nearest the heart of the plant, and this is a good way. In August your seeds will be ripe enough, and then cut open the cucumber and put pulp and seed into a tub there to remain 8 or 10 days, stirring them every day to the bottom with a stick; at the expiration of that time, pour water into the tub, and by stirring it often, and repeating it, the scum will rise to the top and your seed subside, which are to be dried and put into a bag, and are best when three or four years old. Your seed that are intended for pickles, should be sown in May, about nine in a hill, and in five or six days they will appear above ground; and for about a week after, till the plant has made some progress, are very liable to be destroyed by sparrows, they being very fond of them. Leave only four or five of the most vigorous plants in a hill, and observe to water in a dry season, and keep the ground about them loose and free from weeds. The earth should be laid round your plants in the form of a basin, to hold the water that is given them, and take care that your plants don't interweave with one another, and if any plants appear fading, or declining, pull them up. Fifty holes is the number advised, from whence you may expect to gather about two thousand in the season. Miller mentions the putting your plants into baskets, when they are fit to transplant, filled with earth, which may be removed with the plants in them, into other hot beds with great security, by which means you have a crop much earlier than in the method before mentioned. If cucumbers are stuck as you do peas, they will run to a great height, and will bear till the frosts destroy them.

Currants, or corinths, so called from a near resemblance to a Corinthian grape, (*ribes by the botanists*) have many species, but the two principal are the red, and white of which the Dutch sorts are chiefly propagated in England. They are to be propagated from cuttings, planted in the fall, (September) and are directed to remain two years, when they are to be removed into beds, and planted in rows ten feet asunder, and four feet from each other. But the cuttings will succeed as well if planted in a rich light bed to stand without any removal at all. They will grow either against walls, pales, or espaliers. If some are planted against a south wall or in a warm place, and others in a colder situation under a north wall, the fruit will last a long time, as there will be a succession. The fruit grows on the former year's wood, on small snags, which come out of the old wood; wherefore, in pruning, these snags ought to be preserved, and the young shoots shortened in proportion to their strength. In pruning, cut off the old wood, and not in heads. I find no directions as to keeping them on single stalks, but I believe this method is best. They will grow in any soil or situation, even under trees, though the open air is best. Your plantation must be renewed in seven or eight years.

Chamomile, *Chamomelum*, (from *melon*, *gr.* an apple, because it has the scent of one,) or *Anthemis*, as its called by Dr. Linnæus. There are different species, but the *Chamomelum odoratisimum repens, flore simplici*, is the sort chiefly propagated. It is used medicinally, and in making green walks or edgings; the method of planting is, to separate the roots, as they grow very close, and prick each root into poor land, about ten inches asunder, in the month of March; they will quickly stretch themselves into contact with each other, and as the flowers ripen, they should be gathered and dried. When thick, 'tis apt to rot in the winter, so that it ought now and then to be thinned.

Celandine, *Majus Chelidonium*, is a medicinal herb, often cultivated in gardens. The several varieties are propagated by sowing the seed, and the plants will cast their seeds, and keep you constantly with a stock of young plants without further trouble. It is an annual celandine; the leſſer is a ranunculus.

Clary, *Sclarea*, from *Skleras*, *gr.* hard, because it has a hard stalk. These are propagated either from the seed in a light soil, or parting the roots and planting them out at Michaelmas, about eighteen inches asunder; these will last many years.

COMFREY, *Symphytum*, from *sun gr. cum*, and *fuo gr.* to grow to, as it is very good in healing of wounds, it being a vulnerary, is to be propagated by parting the root and planting them in the fall, eighteen inches asunder, or from the seed. Tis hardy, will grow any where, and will last long.

CRESSES, WATER, if not *sysymbrium*, grow in standing water, and may be propagated by throwing the seed in a standing water, and not cutting it the first year. From its agreeable warm taste, it is much esteemed in England, and is very good eating in scorbutic cases, and is a great diuretic.

CRESS, INDIAN, *Nasturtium indicum nasis torinentum*, because the seed when bruised is apt to cause sneezing, known to the botanists, by the name of *acriviola*, a sharp violet, should be sown in April or March, being extremely tender. If stuck, they will climb a great height, and will last till the frost come, and then totally perish. It is thought the flower is superior to a radish in flavor, and is eat in salads or without. My method is to plant the seeds in hills three in a hill, leaving a space in the middle to put the stick, on which they are to grow, and I have found they succeed very well in a rich light soil.

ELECAMPANE, *Helenium*, is a medicinal plant, the root of which is much used by the apothecaries. It may be propagated from the seeds, which are to be planted just when ripe, about ten inches asunder, and will remain in the ground till the succeeding spring when they will make their appearance, and conquer all weeds. They may likewise be propagated from the offsets with a bud at the top; they are to be put in a hole unbent, and the earth thrown over the crown of the plant with the foot; the tops are killed in winter, but they revive in the spring.

ENDIVE, *Endivia cichorium*, succory, from *Choros gr.* a place, because found every where, in order to have an early crop should be sown in the beginning of May, (though it is apt to go to seed when sown early,) and when it is large enough, which will be probably about the latter end of June, plant it out either in rich trenches as you do celery, or in beds, and when it is grown to its full size, tie the leaves up, and earth it up to the crown of the plant. In June sow more seed than July, and when fit, transplant it at about a foot distance as is before directed. When you tie it up observe that the leaves are not wet and are sound, because if tied up at that time they are apt to rot. In December and other cold months, cover the plants with pea haulm, boards or other thing that will shelter them; otherwise, the frost will destroy them. In January or February, or rather March, prick out twelve of the most flourishing plants, and they will run to seed in July, though I believe if they are permitted to stand undisturbed they will seed as well. It does not last above a month after being tied up. In February the plants should, with a flat pointed dibble, be put into the side of a trench, with the crown to the sun.

ESCHALOT, *vide cives*, under title ONION.

FEATHERFEW, *Mulricaria*, from *Matrix*, being good against diseases of the womb, or *Parthenium* from *Parthenos gr.* a virgin, is to be propagated from seed or roots; if the former, they should be sown in March, and if the latter the roots should be pricked out about eight inches asunder in May. If you do not want the seed, cut the stems off when the flowers are past, as they often decay the roots.

FENNEL, *Fœniculum*, *gr.* small hay. This may be propagated from seed, or the plants, as featherfew, and nothing more is necessary than to keep it from seeding; because it will overrun the garden, the roots being very strong, and continues a long while in the ground.

GARLICK, *Allium*, *vide* ONION.

GOOSEBERRY, *Groffularia*, by some *Uva*, and by others *Crispa*, because villose and hairy. There are many species and seminal variations amongst the species themselves to be met with, but the two sorts principally cultivated are the hairy gooseberry, and the large white Dutch. They are propagated from the suckers or cuttings, but the latter is preferable, as they produce much better roots than the former, which are apt to be woody. Autumn, before the leaves begin to fall, is the proper time for planting the cuttings out, taking the same from the bearing branches, about eight inches in length, and planting three inches deep, observing to nip off all the under branches, so as to raise it to a head on a single stalk; in October, you are directed to remove them into beds about 3 feet asunder, and having been one year in the nursery, they are to be removed to the places where they are to remain six feet asunder, and eight, row from row, observing to prune their roots, and all the lateral branches about Michaelmas. The London gardeners prune their bushes and cut them with shears into hedges; but this method is not approved of by Miller, who advises pruning with a knife, thinning the bearing branches and shortening them to about ten inches, cutting away all the irregular ones; by this culture, I doubt not the gooseberries would be as good as any in Europe. There is a small gooseberry very leafy, and which bears its leaves and fruit a long time, that is, not worth cultivation, wherefore I would advise the banishing them from the garden.

GROUND IVY, *Hedera terrestris* or *Glechoma*, will grow in any shady place, where the roots are transplanted, and will overspread the ground if not restrained.

HORSE RADISH. *Cocklearia, from Cockleare, lat:* a spoon, because the leaves are hollow like a spoon, is a species of the scurvy grass. It is to be propagated from buds or cuttings from the sides of the old roots, in October or February, the former for dry land and the latter for moist. The offsets should have buds on their crowns, and the heads planted out should be about two inches in length. The method of planting them is in trenches about ten inches deep, about five distance each way, the bud upwards, covering them up with the mould taken out of the trenches. Then the ground is to be levelled with a rake, and kept free from weeds, and the second year after planting the roots may be used; the first year the roots are very slender. When you have cut from a root, and separated as much as you have occasion for, put it into the ground again with the head just above the earth, and it will restore itself, if not pulled up soon after. It ought to be planted in very rich ground, otherwise it will not flourish. This method of planting I am so well pleased with that I never had any horse radish in my garden, till I strictly pursued it, and I advise every one to follow it.

Honey-suckles, *Caprifolium*, because the goats eat the tender plants. The red is the Italian, the pale, English; roots or cuttings will produce it. They may be removed in bloom for the sake of a prospect, and replaced when out of bloom.

Hyssop, *Hissopus*, is a purging or cleansing plant, for in the Psalms it says, "purge me with hyssop," and though the hyssop of the ancients we are in some respect unacquainted with, yet we have reason to believe it was a low plant, for Solomon is said to have described all plants from the cedar to the hyssop. If propagated by seed, they should be sown in poor dry land in March, in beds, and when fit should be transplanted where they are to remain about two feet asunder. If from cuttings, they should be planted out in April or May, in a border defended from the heat of the sun. It is a hardy plant, and if not in dunged ground, which makes them luxurious and feeble, they will resist the severest weather. The winter is thought to be the ancient hyssop, because it is much demanded, and used in the eastern countries, in washings and purifications.

Lavender, *Lavendula, a lavendo*, because good in washings and bathing, as it scents the water and beautifies the flesh, should be propagated from the cuttings or slips, and planted out in March in a poor gravelly soil. It has been found that this soil suits it best, will give it more aromatic smell, and that it will resist the winters here better than in a rich soil.

Lettuces, *Lactuca*, from *lac*, milk, they being of a milky substance which is emitted when the stalk is broke. There is a common garden lettuce which is sown for cutting young and mixing with other small salads, and is the cabbage lettuce degenerated, as all seed will do that is saved from a lettuce that has not cabbaged closely. These may be sown at any season of the year. The cabbage lettuce should be sown every month, to have a succession, and drawn as all the sorts ought to be, to stand at different distances, and these should stand at about ten inches asunder, and by replanting those that are drawn, they will head later than those which stand, by which means you may have a succession. This sort of lettuce is the worst of all the kinds in my opinion. It is most watery and flashy, does not grow to the size that many of the other sorts will do, and very soon runs to seed. When I say the seed is to be sown every month, I mean only the growing months, the first of which February is esteemed, and August the last. In August you should sow your last crop, about the beginning of the month, and in October, transplant them into a rich border, sheltered from the weather by a box with a lid, which should be opened every morning and closed in the evening; and in the month of February you will have fine loafed lettuces. Lettuce is a hardy plant, particular the Dutch brown, and will stand most of our winters, if covered only with peas or asparagus haulm, mats or straw. In order to have good seed you should make choise of some of your best cabbaged and largest plants, which will run up to seed, and should be secured by a stick, stuck into the ground; and different sorts should not stand together, for the *farina* will intermix and prejudice each other, and none but good plants should be together for seed; experience has shown that the bad will vitiate the good, and the seed from the plants that have stood the winter are best. The seed is good at two years old, and will grow at three if carefully preserved.

The **Cilicia**, imperial white, and upright *Cos Lettuce*, should be sown in February or beginning of March, and should be drawn so as to stand, Miller says, 18 inches at least distance from each other, but thinks two feet much better.

The **Egyptian** green *Cos*, and the *Versailles* upright *Cos* and *Cilicia*, are most esteemed in England as the sweetest and finest, though the imperial wants not its advocates. I, for my own part, give it the preference for three reasons, the first is, that it washes by far the easiest of any. Second, that it will remain longer before it goes to seed than any other except the Dutch brown; and lastly, that it is the crispest and most delicious of them all.

The **Dutch brown**, and green capuchin, are very hardy, will stand the winters best, and remain in the heat of summer three weeks longer than any before they go to seed, which renders them valuable, though they are not so handsome or elegant a lettuce as any of the former. They may be sown as the common garden lettuce in the spring, and in August as before.

The **Aleppo** and **Roman** lettuce cabbage the soonest of any, and may be propagated for that reason; the first is a very spotted lettuce. Col. Ludwell gave me some of the seed, but it did not please me so well as the other more common sorts; all the seed on a stalk will not ripen at the same time, so you must cut your stalk when some of the first seed are ripe. Mice are very fond of the seed. Some lettuces show a disposition to head without assistance, these should not be touched, but where they throw their leaves back they should be tied up, though that restrains them from growing to a great size. They will not flourish but in rich land, and if dunged, the dung should not be very low, because the root of a lettuce will not go down so low as the dung is commonly spitted into the ground. The time for gathering the seed is when the plants show their down. Transplanting it is said contributes towards cabbaging, but they will cabbage, from my experience, every bit as well without. By transplanting you retard the growth, and by that means may have a succession.

Marjoram, winter, pot, and wild, *Origanum*, from *Oros gr.* a mountain and *ganumai gr.* to rejoice, because it delights in a mountainous soil.

This may be propagated either from the seed, cuttings, or parting their roots in the spring, and if kept clear from the weeds, will stand a number of years.

Marsh mallow, *Althæa gr.* from *Althos gr. medicament.* These may be raised from seed sown in March, and transplanted into pots or elsewhere, or from cuttings planted in May, in a light soil and shaded.

Mint, *Mentha,* from *mens,* the mind, because it strengthens the mind. These should be planted in the spring, by parting the roots or cuttings, and planted six inches asunder; otherwise the roots mat into one another and destroy themselves in three years.

Melons, from *Mælon gr.* apple because of its fragrancy. The Italians call it *milo,* from *mille* a thousand, because not one in a thousand is good. There are but three sorts of melons that Miller says are worth cultivating, the Portugal or pocket melon, which is small and round, the Cantaleupe melon, and the Zatta melon; the green fleshed melon, and the netted wrought melon, he does not esteem, though I have found them very delicious in this country. There is a rough knotty melon called the Diarbekr, from a province belonging to the Turkish empire in Asia, which is reckoned the most exquisite of all melons, which have been brought to great perfection here, and which are not taken notice of by Miller, probably because it has been brought into England since the publication of his dictionary, unless it is the Zatta melon. The Portugal melon has been called by the name of King Charles' melon, because he used to carry one in his pocket, and also Dormer's melon, because brought from Portugal by a general of that name. The Cantaleupe originally came from Armenia on the confines of Persia, but took its name from Cantaleupe, a province about six miles from Rome, where they produce the best. It is known all over Europe, by the simple name of the Cantaleupe melon, and agrees with all stomachs and palates. The Zatta melon is greatly esteemed in Florence, Italy, &c. It is small, deeply furrowed, rough and warted, and compressed at the ends. Melons should never grow near one another, if of different sorts, or by any means near gourds, cucumbers, &c. because the farina of one will impregnate the other, spoil the relish of the fruit, and make them degenerate. Melon seed should not be sown before three years old, and though they will grow at ten or twelve years, yet they should not be propagated after six years. The early melon is of little value; the middle of June is early enough. In order to have a proper succession, the seed should be sown at least at two different seasons, about the middle of February if seasonable weather, if not, the latter end. The second sowing should be in March, and the third in May which last will yield a crop in August, and last till October. The early sowings should be covered with oil-paper in preference to glasses. The culture of melons and planting them out is the same with cucumbers, to which we refer. The compost used by the Dutch and German gardeners, for melons, is of hazel loam, one-third part, of the scouring of ditches, ponds, &c. the same, and a third part of rotten dung all mixed together, and mellowed by being frequently turned over and kept twelve months. But Miller prefers two-third of fresh gentle loam and one-third of rotten neat's dung, kept together a year, and often turned. It will take about fifteen good wheel-barrows of dung to a light. Melons of all sorts, but particular the Cantaleupe, should be planted out as soon as the third or rough leaf appears. These seeds do well to be sown on the upper side of a cucumber bed. One plant is enough for a light. Watering is very requisite, but in much smaller quantities than for cucumbers, and the water should be laid on at a distance from the stems. When the plant has four leaves, the top of the plant should be pinched off, in order to force out the lateral branches. It must not be cut or bruised; that wounds the plant, and takes a considerable time to heal. The roots of melons extend a great way, and often perish after the fruit is set, for want of room; wherefore Miller advises that your beds be twelve feet, and when your frames are filled with vine, to raise it so as to let the vines run under them. When the lateral branches, or, as the gardeners call them, runners, have two or three joints, their tops should be also pinched off, and when your fruit is set, examine the vines and pull all off, except one to a runner, leaving at most about eight to a vine, and pinch off the end of the runner about three joints from the fruit; notwithstanding these are pinched off, there will new runners appear, and these should be also taken away. If the ground is not too wet and moist, the lower the plants are the better, and if you plant in a bed, let your trenches be extended in length about three feet and a half wide, and your plants should not be less than five feet asunder, to prevent their vines intermixing. If there are several beds they should be eight feet asunder and the spaces between filled up, for the benefit of the roots, with rotten dung. They ought to be covered in all hard rains. The frames should not be too heavy. Many use laths in imitation of covered waggons. Your fruit should be turned twice a week, for the advantage of the sun, and if lodged on a board or piece of tile, it will be better. Once a week watering will be sufficient. The sign of the fruit's maturity is the cracking near the foot stalk, and smelling fragrantly. The Cantaleupe never changes color, till too ripe. Gather your fruit in a morning before the sun has warmed it, but if gathered after put it into cold water or ice, and keep those got in the morning in the coolest place. A few hours delay in gathering will spoil the fruit, wherefore they ought to be overlooked twice a day. Take your seeds from the richest flavored fruit with the pulp, in which it must lie three days before being washed out, and save only the heavy seed, that which will sink in water.

Millet, from *Mille,* a thousand, from the multitude of seed it bears. There are four sorts, white, yellow, black, and the Sorgo or Guinea corn. It originally came from the eastern countries, and is much esteemed in making puddings. The seed should be sown the middle of March, very thin, as the plants require room, in a warm dry soil. They should be kept clear of weeds, and in August or latter end of July the seed will ripen, when they are to be beaten out. The seed is good for poultry. The black, sort so called from its black seed, is of no use or value.

MULLIN, *Verbascum, quasi barbascum,* from the leaves being rough and bearded. By others it is called *Candele regia Lychnitis,* because its leaves are used instead of cotton in a lamp. And it is also called *Phlomos gr.* from *flego gr.* to burn for the same reason. The seed should be sown in August, in drills, each seed about six inches asunder, and in the spring transplanted in a warm light situation.

MUGWORT, *Artemisia* wife of *Mausolus,* king of *Caria,* who first brought it into use, or *Parthenis* as it was before called, because supposed that a virgin goddes, gave name to it; or *Artemis gr. Diana,* because good for the disorders of women. This plant is propagated by parting the roots, either in spring or autumn, and will grow in any soil or situation. They spread very much, to prevent which their side shoots should be cut; from one species of this the moxa is got, being the Lanugo or downy substance under the leaf.

ONION, *Cepe.* There are three sorts for winter use; *cepe oblonga,* or Strasburg, *vulgo cepe vulgaris, floribus and tunicis purpurescéntibus* or red Spanish onion, and lastly *cepe floribus* and *tunicis candidis,* or the white Spanish onion, by some the stomers. There are other sorts which suit the spring and summer seasons best, those are *cepe ascalonica,* from *Ascaton,* a city in India, or the scallion or escallion. The cives or cepula the young onion. The Welsh onion, and lastly the *ciboule.* The three first sorts should be sown in February, the first open weather, or beginning of March at farthest, and in about six weeks your onions will be up, and ought to be weeded. The rows should be about 12 or 18 inches asunder if sown in drills, which is the best method, and the plants should be drawn to be about 5 or 6 inches apart. This may be no loss, because they will serve with young salad in the spring. About the middle or latter end of July your plants will be ripe, which may be discovered by the dropping down or shrinking of the blades, then they should be drawn up, and the extreme part of the blades should be cropped off, and the plants laid on the ground to dry. They should be turned at least every other day, otherwise they will strike fresh root, especially in moist weather. In about a fortnight they will be sufficiently dried, you are then to rub off all the earth and take care to remove all that are any ways decayed, and the sound ones laid as thin as possible, in some room or garret as close from the air as possible, and at least once a month look over them, to see if any of them are decayed, for if any are so, they will affect the rest, or if too near one another, or in heaps, they will heat and probably ruin the whole crop. The white onion is the sweetest, though all the three sorts will degenerate into one another in the course of time. In March you should dig a trench, and put some of your most flourishing plants about six inches deep, and as far asunder, into it, which should be covered over with a rake, and in about a month's time the leaves will appear above ground, and when your plants begin to head, they should be supported by stakes and pack-thread or yarn, otherwise they will be very liable to be injured by the winds. These will produce your seed, about August, which may be known by the seeds changing brown, and the bells where the seed is contained, opening. The heads should be critically cut, otherwise the seed will be dropped, and when cut, the heads should be exposed to the sun, and sheltered in the night and wet weather; and when sufficiently dry they should be rubbed out, and after being exposed one day more to the sun, may be put into bags and preserved for the following year. The scallion is a small onion, and is sown early in the spring, and never forms any bulb, and is used green in the spring with young salads. The ciboule and Welch onion are thought to be the same by Mr. Miller.

The CIVES never grows into bulbs, but in bunches, and Miller takes it to be shalot. They don't grow above six inches high in the blade. They are to be propagated by parting the roots or planting the cloves. They don't effect the breath so much as the other sorts. The Welch onion at some seasons of the year (viz: in the fall) dies away, but revives in January, and becomes very early in the spring fit for the table.

GARLICK, *Allium* from *Aleo gr.* to shun from its scent, should be propagated by planting the bulbs in August or September, about 5 inches asunder. These die about July, and then should be taken up and hung in a dry room for winter use. All these several sorts delight in a rich sandy soil, and eight pounds of seed will sow an acre. When sown, they should be trod; so should they be treated when they run too much into blade, in order to throw their substance into the bulb, and when trod they ought to be covered with fresh mould. The seed for sowing should never be wet, because it will shoot out its radicle, and never succeed afterwards.

PARSLEY, *vide* CELERY.

PARSNIP, *Pastinaca* from *Pastus,* fed, because its plant is edible. The seed should be sown about February or March, in light ground dug pretty deep, and may be mixed with carrots; though Miller advises against mixing with any thing else, because, they spread very much in the latter end of summer. They should be kept very clear of weeds, and should be drawn to about 10 or 12 inches asunder. When the leaves begin to decay, which will be about February, after frosts, they should be dug up and put into dry sand, which will preserve them till April. They are not sweet till bit by the frosts. In order to have seed, your strongest plants should be planted out in the spring, and in August or beginning of September your seed will be ripe. You must then cut off the heads, and let them be exposed to the sun three days, in order to dry them, after which they should be beat out, and put up for use. Seed are not to be trusted after a year old.

PEAS, *Pisum,* from *Pisa* a city, where it anciently grew in great plenty, or from *Pesen gr.* he fell, formed from the verb *Pipto gr.* because this plant, if not supported, will fall to the ground. There are several sorts of pease, and which have different properties, some being early, and others late. There are the Charlton-hotspur, Reading-hotspur, and master-hotspur, but are very little different from each other. These are the earliest, and are reckoned much preferable in flavor to any other kind. These should be sown in November, and covered in the winter. There are likewise the rouncivals, the Spanish maratto, and the marrowfat or Dutch admiral, but these are of a later sort, and are intended to come in succession, when the forward kind are gone. You should sow your peas every fortnight, and as the hot weather comes on, the latter sort should be in a sheltered situation, otherwise they will burn up. I would recommend sowing in drills about 2 or 3 inches deep, levelling the ground very smoothly with light mould, in rows about four feet asunder, for the convenience of going between to gather the crop, and raising cabbages or other things at the same time. In the spring let your rows be east and west, in the summer north and south, for a reason which must be obvious, viz: the giving them as much sun as possible in the first instance, and as little as possible in the last. When your peas are well up, they should be hilled once or twice before they are stuck. This not only strengthens them, but at the same time affords them fresh nourishment. The manner of sticking them is known to every body; I shall only, therefore, mention a caution, to put your sticks firm in the ground, otherwise they are apt to fall when the vines grow rampant, and not to stick them in too near the roots, lest you do the plant irreparable injury. In the spring it has been found that scattering some dry cow dung in the trenches before you sow your peas, has been very beneficial. The charlton and marrowfats may be sown at the same time. Some people soak their peas before sowing, but this often turns out unsuccessfully, for in a wet season they are very apt to rot. There is a pea which came from Holland, with an esculent husk. The ormonds are the hotspur. In order to have peas in the fall, sow the hotspur and a latter sort the 12th day of August, these will yield you a crop from October till the intense weather comes on, in November or December. Your sticks should be pretty long, eight feet is not too high, because the rampant sorts, particularly the crown pea and marrowfats, run to a great height, and keep bearing as they grow. Peas may be preserved as kidney beans are, by laying them in different layers of salt, in their pods, and keeping them quite close.

Potatoes, *Licopersicon*, from *Lupus*, *gr.* a wolf, and *porsica*, a peach. Potatoes seems only a corruption of the Indian batatas, it coming originally from America, in 1623. Dr. Linnæus classes it under the genus *solanum*. There are more raised near London than in any other part of Europe. As the seed is not only uncertain, but very difficult to be raised in England, they are generally propagated from the roots; some take the small potatoes, or offsets entire, others cut the large ones into pieces, observing to plant what they call the eyes. But Miller thinks the best method is to plant the fairest roots, allowing them a greater distance both in the rows, and from one another. The proper soil for this plant is a light, sandy loam, not too dry or moist. The ground should be well worked, and your potatoes planted as soon as the frosts are over, that is, about the beginning of March, in furrows about seven or eight inches, and the rows three feet asunder, and the plants a foot and a half. The ground should be kept clear of weeds, and stirred before the roots begin to stretch themselves out. The haulm of those plants are generally killed the first frost, at which time they should be taken up, and kept in sand quite dry, for use, not too thick, and very dry, least they should heat and spoil. You may dig them up sooner, if large enough, and no injury will be done. This is the case amongst the farmers, for they generally take a crop of wheat from the land, and therefore, must have the ground cleared as soon as possible. The Irish method of raising these plants, is to lay them on the sward, and cover them six inches with mould, and so hill them up as they grow. Hilling is necessary, let them be planted in any manner you think proper.

Pepper, *Capsicum*, from *Capsula*, or *Kapto gr.* to burn, should be sown in April, and should be gathered before the pods grow hard, for pickles.

Radish, *Raphanus*, from *Radios gr.* easy, and *saino gr. appareo*, because they soon make their appearance when sown. There are radishes known in this country by the name of scarlet or salmon, London short-topped, &c., but they are, Miller says, no more than little varieties of the common sort, arising from culture. The gardeners about London sow their seeds in October, in a warm border, so as to have them, if they do not miscarry, in March; but I believe our winters are too severe to admit of this here. The second sowing is about Christmas, which will produce a crop in April; but the best method is to sow every fortnight, from January till the beginning of April, always observing to sow your latter crops in moist land, otherwise they are apt to run up; and indeed, with proper shelters, these sowings may be repeated all the summer and fall. Where the ground is scarce, the gardeners sow carrots and spinach with their radishes, because the last are drawn soon, and give the others room to flourish. The best method of sowing radishes is in drills about a foot asunder, the seed to be put three inches deep in light rich land, though no dung; and if they grow too thick, that is, nearer than three inches asunder, they should be pulled, so as to remain within that distance. In May, you should, in order to have proper seed, draw some of your best plants, such as do not branch, but are straight, and prick them in rows three feet asunder, and two from one another, and when the seed grow brown, they should be taken off, dried, and the pods beaten out, and secured so that the mice cannot get at the seed. There is a turnip-radish, being very like one called in England, the round-rooted radish. These should be sown in March, and allowed a greater distance than the common radish. The black radish will continue, if sown in August, till killed by the frosts; and radishes may be preserved in sand, as carrots are, till the spring. Some people, to have long handsome radishes, make holes in the ground at six inches deep, and put two seed into each, about three inches asunder, by which means your radishes are the better.

Raspberry, *Rubus*, being red. There are two sorts only that are propagated for the sake of their fruit, the white and red, and those either by layers or suckers, though the former are preferable. They should be placed in some abject part of the garden, where they may have room to spread without incommoding any other plant. They should not be less than two feet asunder, and in their rows five, though six each way would do better, in a light loamy soil, neither too moist or too dry. The old bearing branches should be cut down to the ground in October, and the young shoots shortened to two feet, and some rotten dung should be thrown into the trenches. There ought to be a new plantation once in three or four years. Some think they should never be touched, but be suffered to run and grow as they please; others pinch off the dead parts only. If the blossom is pulled off they will produce fruit in the fall. They are pestered with lice, but lime water kills them if sprinkled upon them.

Rosemary, *Rosmarinus*, sea dew, delights in a poor gravelly soil, and has a more aromatic smell than in richer soil, and will stand the cold better. It is propagated by cutting or slips, which may be planted either in the fall (September,) or in the spring, and transplanted where they are to remain after they have taken root; or they may be suffered to remain where the cuttings are first put.

Rue, *Ruta*, from *Ruo*, *gr.* to preserve, viz. health. It is propagated as rosemary, to which we refer, only it must be done in the spring. It is not good for edgings, to which use it was formerly applied, because it either grows too luxuriant, or if repressed, ragged, wherefore it is now discontinued, and made use of only for medical purposes.

Spinach, *Spinachia*, should be sown about the latter end of July or middle of August, when there is an appearance of rain, and drawn, when up, to be about three or four inches asunder. It should be constantly cleared of weeds. In October the spinach will be fit to cut, when you should only crop the largest leaves; in the spring you should sow a fresh crop, which will come to maturity in April, when the winter sowing will run to seed, and the best plants should be reserved for seed. In England they aim at a succession, and sow in January, February and March; but in this country it is apt to run to seed in the spring, and if prevented, is milky and distasteful. The seed should be sown in drills about two feet distance, and if you desire seed, the plants should be about twelve or fourteen inches asunder. Seed sown in the spring will produce as good seed as any. There is a male and female plant, the former of which produces spires of stamineous flowers, which contain the farina, and impregnate the embryos of the female plants, and produce the seed; and if the males are pulled up the seed will not be worth any thing. When the plants change color they should be cut and dried a few days in the sun, turning them every day, and when dried, beat out and preserved from mice. It delights in the best soil.

Strawberry, *Fragaria*, from its aromatic scent. There are three sorts chiefly propagated, the wood, the scarlet or Virginian, and the hautbois; there is a green sort, which some call drayton, and others, the pine apple, from its participating of the flavor of that delicious fruit, but none has ever been brought into this country, and it is but rarely to be met with even in England. September is the best month for transplanting, though it is often done in February. But I have myself transplanted with success when in full bloom. The soil this plant delights in ought to be a fresh loamy sort. If too rich, the vines grow rampant, and do not produce the fruit so good as in ground less enriched. All strawberries should be at least a foot distance, but I recommend two feet, to have them in great perfection. They ought to be planted in beds, with alleys two feet wide, for the convenience of going between to cleanse them of weeds, very prejudicial to them. In the spring, when your vines are in flower, if it is dry, water them, otherwise their blossom will drop off. In September you should pull off all the strings, or runners, and every weak plant; dig up between the beds, and strew some fine mould or wood-pile earth between the plants, observing not to cover them with it; this will greatly strengthen them, and your fruit will be much larger. They do not last above three years, so that to keep constantly supplied, you should make a new plantation a year before the old ones are destroyed. The scarlet strawberry will come a fortnight sooner than any other sort. The Chili strawberry will grow to the size of a hen's egg. The best dung (if any,) for strawberries, is that of cows, sheep, and pigeons. In order to have them later in the season, and to afford a succession, cut off the tops of some before they blossom, which will retard their ripening till the forward ones are gone. Many people keep them constantly strung, but I should imagine that wounds them, but in the proper season. It is thought a clayey soil suits them best, because the best are found at Hammersmith, where the best and most bricks are made. Ashes, if not in too great a quantity, (for they are then too hot,) suit them very well.

Sage, *Salvia*, *salus vita*, may be propagated in any of the summer months, if watered and shaded till they have taken root. It delights in a dry poor soil. There are fifteen different sorts, but the common or green, and the red are principally cultivated. The broad leaved sage is preferable for tea.

Salsify, or goats' beard, *Tragopogon*, sow in March or April, in rows a foot asunder, keep the plants six inches distance, and take them up when the leaves decay.

Tansy, *Tanacetum*, is propagated from the creeping roots which shoot out if undisturbed, and may be planted in spring or autumn, at about a foot distance. The paths round the bed should be often dug, in order to keep the roots within bounds.

Thyme, *Thymus* from *Thuos gr. odom* or *Thumos gr.* animal spirit. This is to be propagated either from the seed, or parting the roots. If from the former, the seed should be sown in March, if from the latter, the slips from the roots should be planted the latter end of the same month, about six inches distant. This plant impoverishes the ground much, for nothing will succeed in land where thyme has grown the preceding year.

Turnip, *Rapa*. The white and purple rooted turnip, are the two sorts chiefly cultivated in England for the table. They delight in a light sandy soil, and not rich, for that makes them sticky and rank. Fresh land suits them better than land worn out, and will communicate to them a sweeter flavor. The gardeners about London, sow their seed successively from March to August, for the market, though such as are sown early are liable to be eat by the fly in dry weather, wherefore it is advisable to water. But the farmers sow from June to the middle of August; after that time they will not apple kindly, and if you intend your crop for the table, in the summer it would be proper if possible, to put your seed into a moist soil, and in some open place not near hedges, &c. It is said they are a great improvement to barren land. The ground intended for this purpose should be well worked and made as fine as it can be, and if you sow a large quantity, it should be in drills very thin, the common allowance being one pound to the acre, though two are very sufficient, and should be harrowed in, and rolled in order to break the clods, and in ten days your seed will come up. When your plant has four leaves, your ground should be hoed, and the turnips pulled, to be about six inches asunder, and about three weeks or a month after they should be hoed a second time, and left within eighteen inches, or two feet; for what they want in number will be sufficiently compensated in weight. Ten inches are a sufficient distance for roots intended for the table, because the largest are not generally esteemed the sweetest. It is but of late years, that turnips have been sown in the fields for cattle, and yet it was practised by the ancients, for Columella recommends the sowing the rape for cattle. In many parts of England, at this day they are ignorant of the method, for they sow their seed with barley in the spring, and when the barley is cut, the turnips afford the sheep something green to pick up. The proper method of sowing turnips in the field is with the drill plough, in rows three, four, five, and six feet asunder, the last is most recommended. Lord Townsend sowed an acre in drills, and worked it with the plough, and another acre in broad cast and hoed by hand, and the turnips sown in drills; yielded a ton and a half in weight more than that which was sown in the other husbandry. The great danger turnips are liable to, is from the fly, in dry weather, when the leaf is tender and smooth, wherefore you ought to sow a little soot along the drills, which will keep the fly off, till the rough leaf comes on, and then the fly wont touch it. Caterpillars sometimes attack these plants when they have surmounted the enmity of the fly, but some hungry poultry turned into the turnip field or patch in a morning, will soon get it rid of these insects. Miller recommends feeding cattle or sheep on turnips, within hurdles which should be removed every day, otherwise they will destroy a great quantity more than they can eat. The best mutton in England is fed on turnips, and tis a vulgar mistake to say it makes it rank. In order to save seed, some of the fairest plants should be transplanted in February, about three feet asunder each way.

A GARDENER'S CALENDER.

January. Prepare hot-beds for cucumbers; as little can be done this month in a garden, I would advise the preparing of your dung, and carrying it to your beds, that it may be ready to be spread on in February.

February. Sow asparagus, make your beds, and fork up the old ones, sow sugar loaf cabbages; latter end, transplant cauliflowers, sow carrots, and transplant for seed, prick out endive for seed, sow lettuce, melons in hot beds, sow parsnips, take up the old roots and prick out for seed, sow peas, and prick them into your hot beds, sow radishes twice, plant strawberries, plant out turnips for seed; spade deep, and make it fine, plant beans.

March. Slip your artichokes, if fit; plant kidney beans, cabbages, celery, parsley, cucumbers, currants, chamomile, celandine, nasturtium, featherfew, fennel, ivy, horse-radish, hyssop, lavender, lettuce, radishes twice, marjoram, marsh mallow, mint, melons, millet, mugwort, onions and for seed, peas twice, potatoes, raspberry, rosemary, rue, spinach, tansy, thyme, turnips. You may begin to mow your grass-walks, and continue so to do every morning, and roll them; turf this month, and plant box.

April. If artichokes not slipped last month, do it this; plant bushel and garden beans, sow cabbages; 12th, sow cauliflowers; sow celery, cresses, nasturtium, lettuce, peas, sow radishes twice; sage will grow in this or any other month; turnips, sow salsify early, pepper. Turf this month.

May. Latter end, broccoli, celery, cucumbers for pickles, endive, featherfew, hyssop, cuttings of marsh mallow, melons, peas, sow radishes twice, kidney beans. Turf this month.

June. Cabbages should be sown, sow radishes twice, transplant cabbages, prick out cauliflowers, do. broccoli. Draw up by the roots all your weeds.

July. Transplant broccoli, sow cabbages, coleworts, transplant cauliflowers to stand, endive, gather millet seed, take up onions, sow radishes, twice, sow turnips, plant kidney beans to preserve.

August. Sow cabbages; latter end, carrots, get your cucumber seed, sow cresses, prick out endive, early sow lettuce, mullein, gather onion seed, plant garlick, get parsnip seed; 12th sow peas for the fall, sow radishes; middle, sow spinach, though some say not till after the 20th; sow turnips.

September. Sow cabbages; 10th, sow cauliflowers; plant cuttings of currants, clary comfrey, plant cuttings of gooseberries, sow radishes, plant layers or suckers of raspberries, rosemary, plant out strawberries, string your strawberries, and dress your beds, plant tansy.

October. Latter end, cut down your asparagus, and cover your beds with dung, plant beans for spring, sow cabbages; 20th, transplant cauliflowers, plant horse radish, prick lettuce into boxes, sow peas for the hot bed, radishes; turf this month.

November. Take up your cabbages, sow cabbages, take up your cauliflowers, such as are flowered, and house them, take up your carrots, trench all your vacant land, prune your trees and vines, plant out every thing of the tree or shrub kind, that has a root to it; if any thing is done to your artichokes, this is a good month; plant box; turf early.

December. Cover your endive with brush, cover celery, and every thing else that needs shelter, if the weather will admit, turn over your ground that is trenched, in order to mellow it, and pulverize it. Whatever will prevent delay and enable you to begin spading in February, should be done this month.

From the Silk Grower.

A STATEMENT OF PRACTICAL SILK BUSINESS.

To the Committee on Silk, American Institute:

Gentlemen—The vast importance of the silk culture to our country, and the eagerness of the public to obtain information respecting it, make it the duty of every one engaged in producing a "silk crop," to furnish his quota of knowledge, that thus a mass of practical information may be collected, from which we may go forward with confidence, and gather in the rich harvest which is before us.

With these views, and in compliance with the solicitation of my fellow-citizens, I give you the result of my experience during the past summer. I would first premise, that in making a trial of the silk culture, it was my desire to adopt a mode which could be followed by our agriculturists at large, rather than to show the greatest possible quantity of silk that could be produced from a given portion of land. Such an experiment, made under peculiar advantages of soil and culture, yielding a large product, might be viewed with admiration; but the means being beyond the reach of the mass of our citizens, the same results could not be attained.

The field from which the experiment was made, was situated in East Hartford—the soil, of a light, sandy nature, of a quality termed in that quarter, good corn-land. It was ploughed about the middle of May, and harrowed and furrowed in the usual manner. The roots and trees (morus multicaulis) were now laid down and covered from two to four inches, the tops having a slight upward inclination; they were placed about twelve inches apart in the row, the rows three and a half feet apart, having been previously moderately manured.

After the field was planted, a section comprising one eighth of an acre was marked off, to be subjected to a more particular experiment. It was stocked with 780 roots and trees, all of one year's growth, having had their tops partially or wholly killed by the severity of the past season. One-third were two feet high, one-third one foot, stripped of their limbs, and the remainder were roots without tops. By the 1st of June the new shoots began to show themselves, and by the 1st of July they numbered 4,800, and had attained the height of twelve to eighteen inches.

A family of 4,000 worms were now started, which wound up on the 23d July, having consumed 131 lbs. leaves. Three other lots, amounting in all to 28,000, were now put out at intervals of several days, in order to favor the increasing growth of the leaves. By the 10th of Sept., the last had finished their labors. Weight of leaves consumed in Aug., 701 lbs. and in Sept. 332 lbs.

Total weight of leaves gathered, . . .	1,164lbs.
Total number of worms fed, ...	32,000
Producing nine bushels cocoons.	
Yielding (so far as reeled) 1 lb. of silk per bushel.	
Weight of cocoons, ...	95 lbs
Waste silk, and floss, ...	1 lb.

Twenty-seven thousand of the worms were of the two-crop kind, requiring 4,000 to make a pound of silk and consuming 144 lbs. of leaves. The remaining 5,000 were the long-crop six-weeks worms, 2,500 of which produced a pound of silk, and consumed 90 lbs. leaves. It was my intention to have fed the long-crop worms entirely, as they are known, to be much the most productive of any other kind, but they could not be procured.

Business now calling me away, the feeding was discontinued, and the trees were immediately removed from the ground, having attained an average height of 4½ feet, well-rooted, and with heavy limbs.

The produce of the one-eighth of an acre, as above, it appears is 9 bushels cocoons or 9 lbs. silk; being at the rate of 72 lbs. per acre, from the feeding between the 1st July and the tenth Sept. It is easy to see, that had the 1,164 lbs. leaves been fed to worms of the six-weeks kind, the yield would have been 18 lbs. of silk, or nearly—and from the rapidity with which the new leaves were developing when the trees were removed, it is presumed that had they remained during September, enough more might have been added, to have swelled the product, so as to have made the crop at the rate of 125 lbs. per acre.

During the period of feeding, the safety and even advantage to the tree of frequent defoliation was fully proved. The trees from which this experiment was made, were stripped of their leaves four different times, yet at no time were they inferior to others that were untouched; on the contrary, it was remarked, that where the leaves were removed, the limbs shot forth with greater vigor—care being taken to leave the tender leaves at the ends of the branches.

The very great advantage of this species of mulberry over standard trees, was manifest; while such trees are difficult of success, and from the small size of the leaves, requiring much labor to gather any quantity, it was easy for a child to take from the morus multicaulis 15 to 20 lbs. in an hour.

The plan of retarding the hatching of the eggs by keeping them in an ice-house, was found perfectly successful; the worms which wound the finest cocoons were thus kept back until the 3d of August.

It may be useful to new beginners to know, that the large six-weeks worm, either white or sulphur colored, is altogether preferable to the two-crop; for not only are they more productive of silk, but from their superior length of thread, the reeler is able to produce silk of better quality, and with less labor.

The convenience of a shrub tree, where the farmer wishes to change his crop, may be seen from the fact, that with the use of a plough, the trees on this section of land, 4,800 in number, were turned out of the ground in 30 minutes. An hour more was sufficient to cart them from the field.

Every one who takes up the culture of silk, is surprised at the ease and certainty with which it is produced, and of this experiment it may be observed, that none of the persons who took care of the trees, gathered the leaves, or fed the worms, had ever seen a tree or silk-worm before.

I am not acquainted with the comparative merits of the morus multicaulis, and other kinds of the mulberry; but large as has been the estimate of some cultivators, of the produce and value of the former, I believe its astonishing power of reproducing foliage, its tenacity of life, and the great ease with which it is multiplied, have never been overrated. A friend informs me that a field of roots, deprived of their tops last fall, remained in the ground during winter, and that from the new shoots, which started as early as any other vegetation, he was able to feed from one to two months earlier than from others planted the following May. From these collected facts, we may form an idea of the quantity of leaves, and the consequent weight of silk that may be obtained from the morus multicaulis, when it shall have attained greater age, even in this latitude.

I am not able to name the cost of raising silk; but an intelligent culturist of my acquaintance, from a proof of three successive years, rates it at $2 per lb., exclusive of the cost of trees and the tillage; respecting the latter, I am of opinion the labor bestowed on a field of mulberry, need not be more than on a field of Indian corn.

It appears, therefore, that nearly all the labor of raising silk, viz: plucking the leaves, feeding the worms, and reeling it into sewings, may be performed by the females of a family, and thus the product be considered a clear gain, like that of any other collateral branch of farming. The growing of silk needs but to be looked into, to be appreciated; and if 100 pounds can be produced the first year of planting, worth $5 the pound in raw silk, or $9, when in sewings, what other crop, it may be asked, can be named coming near it for profit?

I will only add, gentlemen, that it is cheering to see the interest the American Institute has taken in this all-important subject, and to express the hope, that the coming exhibition, from our silk-growers, and the increased patronage of the institute, may give to it a fresh interest.

Yours, respectfully,
J. DANFORTH.

Hartford, Con., Sept. 19*th*, 1838.

To the Committee on Silk, American Institute :

Gentlemen—The accompanying sewing silk, 8½ pounds, is offered for exhibition at the coming fair; and you may consider me a competitor for the premium offered through the Institute in April. This silk was produced from $\frac{1}{16}$th of an acre of land, being one half the section named in the statement annexed. It should be remarked, that the cocoons (4½ bushels) from which it was produced, were sent some 40 miles to be reeled, and consequently were much injured, so as to produce less silk; and from haste in reeling, (to prevent *all* the millers from eating out,) is inferior in quality to what it would otherwise have been. Weight of waste silk and floss, 1 lb.

Yours respectfully,
J. DANFORTH.

For the Farmers' Register.

SKINLESS OATS.

Wardsfork, Charlotte, Jan'y 16, 1839

About three years ago, you enclosed me twenty grains of skinless oat seed; I drilled them carefully, and made a half bushel in the shuck. I sowed them, and they turned out well; from which I made a large stack last year, all of which I intend to sow this spring. I am very much pleased with the oats, notwithstanding they have been repudiated by some writer in the Register, some time ago. If I succeed well with this crop, I will give you a particular account for the Register. I am satisfied now, they are a valuable oat. But, as they have been condemned, I wish to make a full trial of them. R. J. GAINES.

[The success of the trial, so far, is, of itself, a valuable report, and, therefore, is here given to encourage other experiments. The more full future account will be still more acceptable.—ED. FAR. REG.]

PRINCEANA.—No. II.

To the Editor of the Farmers' Register.

I find that my strictures on Mr. Prince's bombastic advertisement, have drawn forth a pungent rejoinder from him; pungent in language, but tame and spiritless in argument. I wish to show that he does not, and cannot successfully controvert the position, that multicaulis trees of southern growth are superior to his own, even with the limitations and modifications with which he now attempts to prop up his vain boasting. In fact, Mr. Prince has almost shifted his ground. It will be recollected that his *challenge* was directed against the multicaulis trees of Maryland and Virginia; for they were the plants that he said had received the encomiums which he thought so unmerited. Mr. Prince now tells us that he does not consider these as *southern* trees; it is only those "of South Carolina and Georgia, and the states south of them," that are of such inferior value. The climate of Maryland and Virginia, is now complimented as approximating so nearly to that of Connecticut, Rhode Island, and Flushing, as to enable us to raise trees almost as good as his own; as even being "*amongst* the best of their kind." With this admission, I see no urgent reason for Mr. Prince's acting on the "defensive." He should have known that discretion was the better part of valor; he might have looked before he leaped.

If I erred in supposing that Mr. Prince meant to include all New England as being adapted to produce multicaulis of "superior growth," the error was certainly a very natural one; for we are distinctly assured in the advertisement as a "truth," that in Rhode Island and Connecticut, "trees of two and three years old are found to be as hardy as an *apple tree.*" Now if they are, under these circumstances, as hardy as an apple tree in those states, it is offering no violence to Mr. Prince's argument, to represent him as maintaining that after reaching the above age, they would flourish co-extensively with the apple. In passing through that term of probation, however, they might be reduced to the melancholy condition of the animal, which died just as he was trained to live upon nothing.

But Mr. Prince claims distinguished merit for having *acclimated* the multicaulis; and he deserves it, if he has succeeded as well as he pretends. In the short space of some six or eight years he has been able to accommodate the habits of this production of a tropical climate to the rigors of a high degree of latitude; to infuse strength into its constitution; to educate it like a child; in short, to make it as hardy as an apple tree! Of all the empirical pretensions which Mr. Prince has set up, none is more vain and ridiculous than this. There is no instance on record, of a tender plant becoming acclimated in such a brief period. Heretofore this process has been the work of ages; and whenever the removal has been so distant from its native clime as that of the multicaulis, the attainment of the object has been but imperfectly achieved at last. But in eight years, at most, the multicaulis, a native of the Phillippine Islands, has been endowed with the constitution of the apple tree, by the potent spells of Mr. Prince. Truly the discovery of the philosopher's stone would not have been more marvellous than this sudden metamorphosis. Even the peach, which has been two centuries in America, has not become acclimated to every part of New England; and the Catalpa, the Pride of India, the fig, and the European vine, some of which are natives of extra-tropical regions, do not withstand, without protection, the severity of milder winters than those of New England. On this subject of the acclimation of the multicaulis, I beg leave to refer the readers of Mr. Prince's letter, to an article in the last number of the 'Magazine of Horticulture,' published at Boston, which reached me by the same mail that brought me the Farmers' Register. That article comes from a most respectable source; not less respectable than Mr. Prince, and quite as disinterested; and expresses the conviction, sustained by facts, that the multicaulis will not answer the purposes of silk culture in the New England states. We are informed by the editor, that the aggregate number of trees has not been increased for some years; and that many thousands of them have been totally destroyed. But Mr. Prince has not only over-rated the value of the multicaulis, as applicable to the climate of New England and New York, but he has been assiduously engaged in depreciating those varieties of the mulberry which can alone withstand the severity of such a climate. Witness his letter to the 'Wisconsin Culturist'—his numerous advertisements, claiming for himself the merit of vending nothing of the "*humbug kind*"—and his attempts, covert as well as open, to put down the Alpine mulberry, which has been gradually gaining in public estimation in the northern states, notwithstanding the mill-stone that has been hung around its neck. One might suppose that in the Alpine, Mr. Prince has beheld the ghost of Banquo, in a fair way of reclaiming the rights of which it has been unjustly and insidiously deprived. This variety, (the *morus moretti* or *M. macrophylla* of Europe) has withstood, without being scathed, a degree of cold which has been destructive to the multicaulis. Its growth is rapid; it is readily multiplied by cuttings; and in amount of foliage it is barely surpassed by the multicaulis itself. When all delusion shall have passed away, it will take a rank in the northern states, similar to that which is now held by the multicaulis in the states south of New York.

In making these remarks, I am actuated only by a regard for the interests and success of the silk culture. However desirable it might be, (and to none would it be more desirable than to myself,) that the multicaulis should justify the character for hardiness which Mr. Prince has given of it, yet it cannot, and ought not to be recommended as offering a *safe* reliance for those who are attempting to introduce the culture into the interior of New England, and New York. If it can ever be saved from destruction, it must be by treating it as a perennial or herbaceous plant. Two intelligent gentlemen from Connecticut, who have recently passed through our state, have confessed as much; though, even under this disadvantage, they placed a high value upon it.

So much for Mr. Prince's arguments, and speculations. Let us now examine a little into his facts, and see if they are not equally as convenient to him. He has condemned southern trees, and affirms that in the northern markets they do not command as high prices as those of his own growth. He even appeals to the dealers of Burlington and Philadelphia, in confirmation of his assertion. I happen to know something of the facts of the case; and if Mr. Prince is really so ignorant of them, he might also be greatly enlightened on some points, by consulting those gentlemen. He would not find it difficult to learn that they do decidedly prefer the trees of Virginia and Carolina, to those of the Linnæan Botanic Gardens. During a sojourn in those cities, during the past summer, it was made no secret, that southern trees commanded the preference, particularly as stock for planting, on account of the superior maturity of the buds. It was the first time I had heard the admission so freely made; and I considered it alike liberal, and creditable to their candor. A gentleman near Philadelphia, in his zeal in favor of southern trees, took me to his mulberry plantation, some miles distant, to show me the marked difference in growth between plants raised from Carolina cuttings, and those obtained from his own vicinity, all growing side by side, in land of the same quality. Those that were procured farthest south were so much larger, and more vigorous, that one might have supposed the ground on which they stood had been doubly manured. The Florida and Mobile trees were but little known. Those which had been received, arrived so late in the season, that no correct judgment could be passed upon their merits for propagation. It was thought probable, however, by some, but given merely as a matter of opinion, that on account of the rapidity of their growth, the fibre of the wood might be soft and spongy, and therefore, not so fit for planting. But this objection, even if well founded, could avail Mr. Prince nothing, since he is in the habit of using immature buds in his plantations. In his rejoinder to Mr. Roberts, he contends that they are more prompt to vegetate, and that they produce as good trees as the matured buds. Perhaps Mr. Prince's ingenuity can alone solve the question, whether the ripe wood of the south, or the immature wood of the north, would have a tendency to continue the growth of its offspring to the latest period in autumn? By the way, this practice of planting green buds is a happy commentary on Mr. Prince's claims in regard to the acclimation of the multicaulis. It is one way of acclimating a plant, which is new in the annals of horticulture.

Mr. Prince is very willing to admit that we can raise fine trees in the south—in fact, that they will "attain their utmost developement"—provided we make use of seed produced at the north. This position is not more tenable than the other, that southern cuttings planted in the north make an incomplete growth. It is an established rule, that the more perfect the organization of the parent, the more healthy and vigorous will be the offspring. I have now before me a letter from an intelligent gentleman, residing at Columbia, S. C., written without any reference to this controversy, and in ignorance of its existence. He says, "I have trees (500) originally from Long Island, five years old, which are not so large or vigorous as those of my own raising, planted in March last!" According to Mr. Prince's doctrine, the succeeding generations could never have attained the same developement as the stock from which they sprung.

Not content with simply claiming a superiority for northern over southern trees, Mr. Prince has undertaken to decide the *degree* of preference to which they are entitled. He says they have one-third more of buds upon them, and are therefore worth 50 per cent more. This assertion is so entirely gratuitous that I cannot imagine how any person having a regard for "truth," could venture to make it. In what respect do they have more buds? Is their developement greater? Mr. P. has virtually abandoned this ground. Are the joints closer together? The proximity or elongation of the joints depend mainly on the size of the plant. A three foot tree at Flushing has precisely the same number of joints that a tree of the same size has elsewhere, excluding the side branches. But a small plant has certainly more buds in proportion to its size than a tall one. Mr. Prince must therefore mean that his trees have more buds *per foot* than southern trees. Granted: but does not this fact imply smaller trees, and thereby impair their value for propagation? A section of such a growth, to be long enough for a cutting, must include a greater number of buds than if the tree was large and vigorous; or if divided into single buds, the pieces are necessarily so short, as to retain their vitality only for a limited time. In regard to the fitness of such wood for propagation, I take the liberty of extracting from a letter written by a gentleman of Flushing, a neighbor of Mr Prince: "Out of 10,000 cuttings," says the writer, "I have raised only 200 trees; cuttings generally turned out badly this year, owing to the season being damp and cold in the spring, and followed by dry weather." The season was equally unfavorable here, but I do not believe there has been any thing like such a failure, in any plantation in Virginia; and from all accounts, Mr Prince's increase from the number planted was not in a much greater proportion.

Mr Prince says I have evaded his wager, instead of accepting it. On this point I must differ with him; for he has never ventured to make it in plain and explicit terms. His first proposition was this: "We now offer to exhibit one, two, three or more thousand of our trees, with any plantation of *one year's growth*, of the same kind, existing in Maryland or Virginia." This offer designates no specific age for his own trees; and if it had been accepted, it might have possibly comported with Mr Prince's notions of a fair "competition," for him to have exhibited *two-year old trees*, while he restricted us to those of one year's growth. Neither does his last offer, though apparently made in such a spirit of liberality, fully meet the case. If he was as sincere and earnest as he affects to be, and really believed in the great superiority of his own trees, he would not be willing to claim any advantages in the contest. I therefore, again assert, that Mr Prince *dare not* show his trees on fair and equal terms. It is now too late in the season to be exhibiting southern trees, as our slender stock is very nearly exhausted; but if Mr Prince will renew his wager for another year, and will say, "We now offer to exhibit in the autumn of 1839, one, two, three, or more thousands of our multicaulis trees grown in New York, or New England, from cuttings planted in the open ground, the ensuing spring, with a like number, grown in the same manner, in any plantation in Maryland or Virginia; and if ours are not superior in the growth of the wood, and number of mature buds, to any other parcel of similar extent, we will pay to the owner of the other parcel one thousand dollars, or one thousand of the trees, he agreeing to pay a similar forfeit, if the reverse is the case." I say, if Mr Prince will make this offer, he will redeem himself from the reproaches he has incurred, of vain-boasting, and insincerity; and his desire for competition shall, in due time, be gratified.

A word in regard to Mr. Prince's personalities, and I have done. He has indulged in them throughout one half of his communication, evidently for the purpose of withdrawing attention from the matter in dispute. They are, however, as harmless in the effect they may have been intended to produce, as they are misdirected. The editor of the Farmers' Register is abundantly able to rescue his own conduct and motives from aspersion; and the arrows of Mr. Prince have not reached me, either directly, or through the sides of another. ANTI-PUFF.

ON THE SEVERAL CLAIMS TO THE MERIT OF HAVING FIRST INTRODUCED THE MORUS MULTICAULIS.

From the Richmond Enquirer.

You will recollect, that it was at your request, received on the 10th, that I addressed a hurried communication for the 'Enquirer' of the 12th October last.

I now desire, through the same medium, to notice a letter of Wm. R. Prince of the 1st of November, 1838—a postcript to the same, dated the 22d of December, following, addressed to the editor of, and published in, the Farmers' Register, vol. 6, No. 12, pages 753 and 4, and also an extract of a letter from Mr. Prince, to Gideon B. Smith, dated the 12th of July, 1830, published in the same No. of the Farmers' Register, page 754.

In my communication of the 12th of October last, I expressed the *belief*, based upon good authority, as I then supposed, that we were indebted to Dr. Norton for the introduction, &c., of the morus multicaulis in this country. During the session of the silk convention in Baltimore, in December last, and since my return, I have obtained such information as induces me now to *believe*, that I was mistaken in the *belief* then so hastily expressed; and as there are now three persons claiming that distinction* I shall not, until I see the title deeds legally authenticated, venture the expression of an opinion as to the proprietary title thereto.

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* Wm. Prince and Son, Dr. Norton. and M. Besson. See F. Register, vol. 6, No. 12, p. 755.

Now for the letters. What does the letter o. November 1st say, (alluding, I suppose, to the simple expression of my *belief?)* "I am not content to let such flimsy statements pass, without a suitable rebuke"—and, how does he rebuke the "flimsy" statement—let us see—to wit: by stating in his letter to Gideon B. Smith, on the 12th of July, 1830—yes, on the 12th of July, 1830—"I should have been pleased, if you had stated, that your Chinese mulberry tree" (now the multicaulis) "came from me—I don't believe *one tree* exists in the country, but yours and mine: we have *about* twenty"!!! What does he say? On the 22d of December, 1838, he says, I sent to Dr. Norton "in the fall of 1828, or spring of 1829, the Phillippine Island mulberry, it not having, at that early period, received the title of morus multicaulis."

If, then, in July, 1830, Gideon B. Smith had but one tree, and William R. Prince only about TWENTY!!! and THE about TWENTY-ONE trees were ALL then in the country, how could he (Wm. R. Prince,) have sent, in the fall of 1828, (near two years before,) a tree to Dr. Norton?"

Is this the promised rebuke of a "flimsy statement?" If it is, there is in it more ********** than *****. I now leave it to the public to say, whether there is more *flimsiness* in my statement than there is *discrepancy* in his own.

Again—According to the testimony of Mr. Carter,* (postscript, December 22d, 1838, upon which Wm. R. Prince relies to show that Dr. Norton had, in the spring of 1828, a tree (morus multicaulis) agreeing "precisely," as he says he sometime since suggested to Gideon B. Smith, it is shown, that Dr. Norton was in possession of the tree as ealy as the spring of '28, and that the doctor and John Carter were propagating rapidly the morus multicaulis in the summer of 1828, whereas he had but about twenty trees in July, 1830, more than two years thereafter; which, with the one then in the possession of G. B. Smith, he, in the same month and year, (12th July, 1830,) stated, "he *believes* are the only trees in the country, (a belief which he must eventually contend was "a flimsy statement,") and which he cannot be "content" to let pass without a suitable (self) "rebuke."

To conclude: I entertain no unkind feelings towards Wm. R. Prince—for Gideon B. Smith I have the highest respect. I have studiously avoided the use of harsh language, other than such as W. R. P. used himself, and have only sought to show, that others, who ought to be better informed than myself, may have been mistaken† in their *belief*, as to whom belongs the credit of the first introduction of the morus multicaulis into this country. I leave the question of first introduction to be settled by the three claimants, and shall not, probably trouble you again. J. W.

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* In this statement, there is a radical error. It is this: Wm. R. Prince never saw *John Carter*—another *flimsy statement*, deserving (self) "rebuke."

† See Farmers' Register, p. 398, 46th to 51st line, and vol. 6, No. 12, p, 754.

From the Farmer's Magazine, (1808.)

COUNTY AGRICULTURAL REPORTS.

The idea of ascertaining the agricultural state of every district in the kingdom, and of printing each survey, according to one uniform model, is the greatest undertaking ever attempted by any institution; and, though carried on with funds extremely inadequate to such an attempt, yet it is at last in a fair way of being happily accomplished. All the counties in England will be completed in the course of this year. Several will remain to be done in Scotland, for the execution of which fit persons can be procured, as soon as adequate funds are obtained for that purpose. In the course of this year, five reports have been already printed, and eight transmitted to the board in a state ready for publication; so that the progress has been considerable, and the termination of this most important undertaking, by which so large a proportion of the funds of the board has hitherto been absorbed, is probably at no great distance.

The advantages to be derived from these reports, are universally recognized in foreign countries; for the same plan has been already adopted in France and Russia, and will probably be imitated in every other civilized country. A letter has lately been received from a celebrated agriculturist in France, in which he states his opinion, "that such a measure is the most useful that can be undertaken, for bringing, in a short space of time, agriculture to a high degree of perfection."* Indeed the information furnished by the various reports and communications published by the board, far exceeds what is generally apprehended. Dr. Coventry, Professor of Agriculture in the University of Edinburgh, who, from his situation, is led to examine every work connected with the subjects on which he lectures, has recently declared, 'that in these late reports and publications, there is detailed more useful and distinct information, on various branches of agriculture, and on rural concerns in general, *than was in print before these were drawn up*.'† What then may not be expected, when all these reports are completed, for little more than one-half of them were printed, when this idea of their merit and utility was formed by Dr. Coventry.

IMPORTANCE OF AGRICULTURE.

To prove the importance of agriculture to a community, seems very like demonstrating the advantages of having food to eat and clothes to wear. That it is, indeed, the first and greatest concern of every nation, and the foundation of its prosperity in every other matter, is a truth so universally acknowledged, that it has obtained almost the currency of a proverb.—*Farmers' Cabinet.*

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* The French expressions are, 'Je crois que ce travail est le plus utile de tout ceux qu'on peut entreprendre, pour amener, dans un tres court espece de temps, l'agriculture à un grand degré de perfection.'

† See discourses explanatory of the object and plan of the Course of Lectures on Agriculture and Rural Economy, by Dr. Coventry, 1 vol. octavo, printed at Edinburgh, 1808, p. 187.

For the Farmers' Register.

ESTIMATES AND REMARKS ON THE PROFIT OF IMPROVING LAND AND FARMING.

To the farmers of Virginia, who are too cautious and too much of false economists to improve their lands, by bringing all the means of improving within their reach, the following remarks are respectfully offered. He who gets rich as a merchant by buying and selling produce, runs great risk of being poor by some fortuitous accident. Every day occurrences teach us this. He who speculates in stock, in gold mines, in multicaulis buds, may suddenly get rich in imagination, be a nabob to-day, to-morrow a beggar: of this we have too many examples, in these days of lottery offices, and all short cuts for getting rich in an hour. But he who ventures a penny to improve his land, in fact runs no risk at all; he gains his pound without a venture of a penny; his return is certain. Who, from the days of Æsop until now, ever heard of any man who sedulously and understandingly went about to improve his land, and lost by it? Some may have come to ruin from extravagance of another sort; but never by any money spent directly on the improvement of the soil they cultivate. This may be a slow, but it a certain way of becoming independent, and riches got in this way stick. They don't come like an April shower, and vanish like the dew. Why then, farmers of Virginia, shall we leave our calling and follow after that which belongs to speculators? "Slow and sure," says the proverb—and "a bird in the hand is worth two in the bush;" let us then leave the golden bird that perches in the multicaulis, to those who are more expert bird-catchers than we; and let us hold steadily to the bird in our grasp. You who are the holders of rich land, I ask to look at the following calculations, for encouragement to keep it rich: you who hold poor land, read them, and be stimulated to make it rich; but both read poor Richard's almanac the while, and learn, that "he who by the plough would thrive, himself must either hold or drive." No manure will answer without the master's foot.

Landlord No. 1. *Dr.* *In ac't twenty acres Land, at* $100 *per acre,* *Cr.*

To interest on cost of land, $2000,	$120	00	By 72 bbls. corn, at $4 00 per bbl.	$288	00
To cost of a man and horse, 1 year,	250	00	By offal from corn,	30	00
Wear and tear tools,	20	00	By 150 bus. wheat, $1 50 per bush.	225	00
Additional labor in harvest, &c.	40	00	By 24,000 lbs. clover-hay at $7 00 per m.	168	00
Cost, hauling and spreading 800 bus. lime,	90	00	By 400 bus. Irish potatoes, 50 cts. per bu.	200	00
Cost, hauling and spreading 800 bus. ashes,	30	00	By wheat-straw, peas, &c., say,	19	00
Cost, hauling and spreading 240 loads manure,	120	00	By whole am't profits,	930	00
To seed, wheat, corn and potatoes,	20	00			
To plaster and clover seed,	10	00			
To whole am't expenses,	$700	00	Balance Cr.	$230	00

Landlord No. 2. *Dr.* *In ac't* 20 *acres Land, at* $10 *per acre.* *Cr.*

To interest on $200,	12	00	By 18 bbls. corn,	72	00
To cost man and horse for 1 year,	250	00	By offal from corn,	7	50
Wear and tear of tools,	20	00	By 6000 lbs. oats, at $7 00 per m.	42	00
Additional labor,	5	00	By 12 bush. peas, at $1 00,	12	00
Seed-oats, corn and peas,	5	00	By pasturage, 8 acres poor land,	6	50
To whole am't expenses,	$292	00	To whole amount profits,	140	00
Balance Dr.	152	00	Balance,	152	00
				292	00

In the annexed account No. 1, I have supposed the twenty acres laid off into three equal fields of six acres each, with a lot of two acres for trucking (if I may make a word.) It will be seen by reference to it, that landlord, number 1, after paying a high price for his land, put manure of different sorts on it to the amount of $250 per annum; and still the land pays this sum, current expenses, and pays him within a fraction of 12 per cent. on his investment; so, that it is apparent, under this system, he will be able to keep his capital increasing in value, while he is at the same time, making 12 per cent. on it. It is equally apparent, that landlord number 2, who wraps his one talent in a napkin, will be brought in debt every year, to an amount equal to more than twelve times the amount of the interest on his investment. What folly then to work poor land without improving it; the means for which every man possesses more or less, on or near his land. If the class I address could lift the veil which covers my name, they might say "physician heal thyself;" but I hope with less truth every day, for I am striving to benefit myself and posterity, while I am helping to brace up our dear old mother Virginia, who is fast sinking under the ruthless treatment of her children; who nourish her with nothing, while they are tugging at her empty dugs, and killing her, while they are starving themselves to death; all for the want of a little energy and enterprise. As a general rule, let me advise my fellow-laborers, if you want productive seed-corn, manure your land, and carefully save the seed; if you want fine wheat, fallow and use lime, and your seed will be good; if you want improved cattle, first rear grass for them to eat, and don't buy a Durham bull at $1000 or 2000 to feed him on straw and shucks in winter, and buds and marsh grass, in spring and summer. It will not answer; his breed, in ten years, will be no better than the common cattle of the country; whereas if you had laid out this $2000 in manure, lime, grass seed and plaster, besides the improvement of your land, you would have in the ten years, converted all your cattle into Durham, without a bull of that breed. I do not mean to throw a damp on judicious importations of stocks, &c. I only mean to ridicule that class, who are guilty of the folly of supposing they can make a week's old bantling, a man, by going to a tailor's and buying him a man's suit of clothes; instead of nourishing him well, and keeping him warm, and giving him time to grow, and develope, with nature's aid, the resources hidden within him.

Mr. Editor I see you yawn. I take the hint, and am, yours, &c. ANTI-HUMBUG.

PROGRESS OF THE MORUS MULTICAULIS TRADE, AND PROSPECT OF FUTURE PRICES.

Inquiries have been frequently made, by letters as well as verbally, and proceeding from strangers as well as from acquaintances, as to our opinions in regard to the probable continuance, or decline, of the high prices of morus multicaulis plants—and consequently, the expediency, thence to be inferred, of entering upon, or avoiding, the "mulberry speculation." These inquiries have been answered to the best of our judgment, not only by our published and general views, but also privately and specially. Still, we have felt reluctant to express opinions, or give advice, not only because the progress of the speculation had outstripped and belied all our previous calculations, but also because our private interest, of ownership, had become deeply involved in the market value of the plants.

The views which we entertain on this subject are, perhaps, but of little worth; but such as they are, they will be given here frankly, in answer to particular inquirers, as well as for the information of readers, and the agricultural public in general.

The prices of multicaulis plants have, in the general, been slowly advancing, from the time in September when we pronounced them to be exorbitant, to this day. There was a decline in November, which seemed to indicate the bursting of the bubble of *speculation*, or *factitious* prices. But the depression was but transient, and was caused by that being the time for *paying* for all the prior purchases; and many persons who had bought without money, and expected to pay by their profits on sales, were compelled to put the plants in market, and sell them at any price which could then be obtained, to meet the debts incurred by their purchase. Since, the prices have not only returned to their previous mark, but have gone beyond. The regular and current prices now, in Richmond, are 8 cents the bud, for cuttings, or entire plants exclusive of roots—20 cents for roots of plants of one year's growth from cuttings—and 20 cents the foot for trees of that age and kind, with or without lateral branches, and taken as they come. There are not many plants now in market, as nearly all are now held to plant; and neither are there many persons seeking to buy at present. There are, however, enough both of buyers and sellers to show prices fairly.

Several public auction sales have been recently made in New York, and reported in the newspapers as having brought much higher prices than the above mentioned—as high as 25 to 30 cents, the foot for small plants; which would be equal to about 4 cents the bud, ripe and green—if any of the wood was immuture. But we have no faith in the reports of these auction sales; as it is very easy, by fraudulent combination, and fictitious bidding, to make prices appear to be as high as the parties may please, or may dare to venture on the public credulity.

The occurrence of one or the other of the opposite results, either of the stock of plants now in this country being of immense value to the owners and the public, or of no value whatever, will depend upon this—whether silk culture proper shall really be commenced and prosecuted to any considerable extent, or that no more is done towards that end than had been when this mulberry speculation was produced, and the prices were rising to their height. If the first-named and most desirable result should be produced, and the culture of silk should be established, so as to promise soon to become an important branch of industry in the United States, then there will be sufficient demand for every multicaulis plant that can be raised in 1839, and at prices yielding good profits to those who plant even at the present high prices of cuttings. But if there should be no more solidity in the present increased and more extended movements towards silk-culture, than was in all those of the north, which had so much sought to attract public attention and gain notoriety, previous to the beginning of this speculation, then the value of plants will sink to nothing as soon as the bubble bursts; and the mulberry mania will compare in all respects with the famous tulip-mania of Holland, and serve to produce, and to leave, as little of real value to the holders, or to the country at large.

In an article of considerable length published in our last October number, we stated fully, and *proved*, that the previous pretended silk-culture of the northern and middle states had resulted in almost nothing; and then supposing that the future was to be judged by the past operations, we pronounced the then rising demand and prices of multicaulis plants as the work and effect of speculation. And we believe now, as much as when the opinion was first declared, that the sudden and rapid advance of the market price of multicaulis plants was almost entirely built upon trading speculation; and if it had continued to be as baseless as it then was, the price would probably have fallen before this time. However little of the reasoning process there may be in deriving proper views of the profits of silk-culture from the existence of a baseless mulberry speculation and mania, there seems now to be good ground to believe that such has been the effect; and that very many persons have thus had their minds, for the first time, effectually directed to this valuable and (as we have long maintained as to Virginia,) profitable branch of industry. We may venture now to say that silk-culture will be commenced by many persons in Virginia and other southern states, and fairly tried; however little creditable it may be to the judgment of the people that this good result will have been produced, not by the sufficient proper inducements which have long existed, and been totally disregarded, but by the stronger stimulus of the mulberry mania; which ought rather to depress than to encourage silk-culture, by making the undertaking so much more costly. But correct reasoning is seldom the mode by which communities arrive at results, or are induced to make changes of old habits; and if such a beneficial change is now to be made, in the adoption of silk-culture, we may be content to welcome the benefit, without scrutinizing too closely the legitimacy of its origin.

Before the commencement of the speculation in mulberry plants, all the establishments for silk-culture of this country, which had for some years been so conspicuous *on paper*, were in the northern and middle states; and to that time, nothing had been performed by any of the numerous silk-companies, to redeem their promises and make good their great pretensions. The facts in regard to these liberal promises and small performances were stated at sufficient length in the article above referred to, and also in another, subsequently, by T. S. Pleasants, commenced at page 449 of vol. VI. In the south, almost nothing had then been done, either according to the northern fashion of conducting silk-culture, or truly and really by feeding silk-worms, and producing silk. The mania for buying mulberry plants spread from the north where it commenced, even more rapidly through Virginia and the adjacent states. But most of the purchasers were of different character, and so will be the effects of their operations, whether caused at first by delusion, or by correct views. At the north, after prices had been advancing, and the mania growing, for several months, and when sales were making daily, and the contracts perhaps had covered an amount far exceeding that at which all the multicaulis plants in the world would have been estimated a few months previously—still the buyers were nearly all mere speculators, and of the most transient operation, who designed to sell again, and very speedily. Very few purchases had been made by farmers, or persons who designed to plant; and, very often, the same lot of plants had been sold several times over, and at continually advancing prices, while they were still growing in the ground of the original proprietor. So far as these went, and they were the principal operations, the trade was simply and purely a speculation, having no regard to the intrinsic value, or future uses of the commodity.

As soon as the new and great demand was generally made known in Virginia, (though it was not soon enough to prevent many lots being bought up at half-price by speculators,) the fever spread and raged here more than even at the north. For instead of being confined there to mere traders in the then existing plants, there arose here a very extensive demand among farmers and others who bought to plant. Thus, except a few large purchases made to supply the great and general demand for small parcels for planting, and which served merely to supply that demand, every purchaser in Virginia bought to make profit by planting, and the future increase and expected value of the product. It is true, that all of these persons also were speculators, though in a different sense. They differed from others in this only, that they speculated on the market value of the *future product*, instead of the present stock purchased by them. But though the large majority of the numerous southern purchasers (unfortunately,) had no view to silk-culture, and many also deluded themselves by extravagant expectations of high prices of future crops of plants—still there are enough of them who design to commence silk-culture proper, to insure fair and extensive trials, and the sure establishment of that branch of industry, should it be approved by the first adventurers. Should this be the result, or even a sufficient promise of it appear during this year, there will be hundreds of those who bought upon mere speculation, who will deem it profitable to retain part of their stock this year, and to increase it hereafter, for its legitimate use in feeding silkworms.

To produce the beneficial and important result of establishing silk culture in Virginia, and thereby to insure a demand for all the growing trees, it is not at all necessary that every one, or that most, of those who have bought mulberry plants shall commence that business. If one only in twenty of the present buyers, or one in five hundred of the farmers who are properly situated for it, should begin to raise silk, these will be enough to spread the business, and to maintain a sufficient demand for plants through this year.

But by a "*sufficient demand*," and sufficient profits for cultivation, we do not mean to affirm, what is believed by many persons, that the present high prices of plants will be sustained for the next growing crop. Such expectation is ridiculous; and if it were possible that it could be realized, the result would do much harm to general interests—though they would be very favorable to the interests of individual cultivators, and to few more than to our own. But if the prices next autumn should be not less than one-fifth part of what the cultivators pay for the stock to plant, they will, with a fair average product, make great profits on their investment and cultivation. Should the prices be one-third of the present rates, planters will make enormous profits; and still more those who bought their stock for planting at much lower than the present rates. And if there should be (what seems now not impossible,) a general awakening throughout the country to the advantages and profits of silk-culture, then the whole stock of plants in this country will not be sufficient to supply the demand of those who will desire to obtain them for propagation, even if without any view to the selling of trees. Should this be the case, each person will take many or few, according as the price may be low or high—thus insuring high prices for a very limited supply, or sufficient demand and remunerating prices for the largest supply.

The same money-price of these trees may be very high, or abundantly low, to purchasers, according to the object of purchase, or their intended future use. If the great demand were merely for speculation, as it was when first produced, we should consider *any price as too high* for planting, and that one-third of the present rates would be enormous. On the other hand, if designed to be put to proper and profitable use, prices higher than the highest yet known can well be afforded for small parcels, to put the purchasers in stock. For it should be borne in mind, that it is not the handful of little twigs for which the buyer pays, perhaps, more than its weight in silver—but for the product which he expects to obtain from that stock. So great is the facility and certainty of extensive and rapid propagation of the multicaulis, that $100 worth of stock to plant, at the highest prices, if taken the best care of, would, in the course of two years, produce from 60 to 100,000 trees; which, at proper distance, would be as large a mulberry plantation as most cultivators would desire to have. Allow one year more, and a commencing stock of only $5 worth will do as much. The only question, then, for the planter and the intended culturist, will be, whether the *time* or the *money* may be of the most value to him. But in either case, the combined cost, in time, labor, and money, will provide a capital for silk-raising more cheaply than the apple orchards were raised formerly in lower Virginia, for making brandy, and which were then considered as an indispensable appropriation of land and capital on every farm. If a kind of apple tree had then been introduced which was as easily propagated as the multicaulis, and would furnish a full crop of apples in two years, then it would have been cheaper for the intended brandy-maker to buy a stock of those trees at 3 cents the bud, rather than the ordinary grafted trees at the usual low prices. It is the wonderful ease and rapidity of propagation of the multicaulis, which is bought, and which causes and justifies the high price to those who design to profit by its use, and not merely by sales. For we repeat, that without using, and availing of its intrinsic value, and to sufficient extent, in the country generally, that, at any price, the purchase of plants will be too dear. But this faculty for reproduction, which causes and justifies high prices, must as certainly operate to reduce them speedily to almost nothing, as articles of sale. We therefore have little confidence in the not uncommon opinion that multicaulis plants will maintain profitable prices, or indeed be worth raising for sale at all, in general, after the present year.

The speculation in this country has spread to France. Some American orders were supplied there, and sales of plants imported thence have recently been made in New York. But the eagerness of the American purchasers soon advanced the prices in France 300 per cent, and then the holders refused to sell, choosing to reserve all their stock for planting. But the whole stock in France, and all Europe, if not in Asia, is smaller than that in the U. States; and, therefore, can but little affect the market here by furnishing supplies. But it is more likely that the fever of speculation will be as fully spread there, and, consequently, not only very high prices be maintained, but that there will also be produced a better knowledge and higher appreciation of the intrinsic value of the morus multicaulis than has heretofore existed in France.

From the New England Farmer.

MULBERRY FEVER.

[The following article presents views somewhat differing from the foregoing. The writer's compliment to the inventive talent of his countrymen was not undeserved. We have not heard yet whether the fabrication of silk-worms eggs, which he anticipates, has been commenced; but, it appears from the 'Northampton Courier' that there are in market multicaulis cuttings manufactured from twigs of bass wood.—Ed. Far. Reg.]

This new disease has become quite epidemic and continues to rage violently. We cannot for our lives divine any especial reason, why it should have burst out all at once among us and so widely extend itself, excepting that all the diseases of this character, (we mean those brought on by speculation and avarice,) are highly contagious. We trust it would not be deemed disrespectful to the faculty, if we suggested that possibly the mulberry doctors have themselves had some hand in creating and aggravating the disorder with a view to their *****. It is not for us to give any words of caution. We have not the care of the public health; but we think it advisable for those, who desire to keep well to keep out of the way of contagion. The disorder has in some parts of the country risen to a state of raving madness, and men, like insects round a fire in the woods of a dark night, are seen dashing into the flames. We have no doubt that the silk business is to be one of the great interests of the country, and one of the most productive and profitable of agricultural employments; but the mulberry tree business and the raising of silk are not precisely the same. One would think, however, from present movements, that every thing is to be accomplished the next year; that the end of the world is to come then; and that the "wedding garment" is to be made of silk of man's own raising. When from a single multicaulis tree perhaps a thousand or more buds or cuttings can be taken in a single season, each of which will in one season, with good luck and good care, form a handsome tree, certainly there need be no difficulty apprehended in the propagation of the plant. When a hundred and sixty or two hundred or four hundred dollars are demanded for a pound of mulberry seed not at all sure to come up,* which can be imported for a twentieth part of that sum with equal confidence of success, we cannot help asking ourselves, where does the money come from, or where has the shrewdness of our merchants and sea-captains gone to? When half a dollar a piece is asked and paid for trees which were grown this season from seed sown last spring and represented to be of equal or superior value for feeding worms with any trees grown, and especially because it is stated that they will "stand our climate," we are really very curious to know what is to be the price next year of cabbage plants; and whether we cannot afford to raise *them* upon a considerable scale at somewhere about forty-nine cents a plant. When silk-worm eggs, which were formerly thought high at eight cents per thousand are now sold for twenty-five cents per hundred, and fifty cents per hundred are even contemplated, we are strongly inclined to believe, and we encourage those who are too anxious to begin at once, to wait patiently; that our Connecticut wooden-nutmeg gentlemen before spring will have an ample supply to meet any demand, dropped on the best hot-pressed letter paper, and made out of the purest yellow bees-wax. But the flame is kindled, and the furnace glows with a white heat. Let those, whose wings are not made of asbestos, try the intensity of the flames if so they choose.

H. C.

LIMING.

To the Editor of the Farmers' Register.

December, 1838.

Dear Sir,—I enclose you my annual five dollars, and return you many thanks for the much and varied information which you have given me in the last year. I should send you some communication for your valuable work; but I forbear—for my friends and neighbors have given me to understand that they think me possessed of a *calcarious devil*. Poor souls! Could I exorcise myself, and cause my devil to enter into them, as into the swine of old, how great would be their profit!

I have purchased since June 1st twenty thousand bushels of oyster shells, and am now hauling, burning, and spreading: my wheat field shows that dear old Mother Earth endorses my work, and I am in grief that I know not how to make her grateful acknowledgments in appropriate terms. But I have a notion that by laws peculiar to herself she marks in characters not destructable by time the deeds of her children. Assuming this, it is not easy to enter into my joys when I spread upon her lap fields of golden corn, or throw over her nakedness a rich green robe bordered with gold. I halt my hobby for a moment to ask if feelings like these can lead to destructive ambition? Happiness is the great object of every being of mind; and who is so happy as he who receives the applause of his mother for virtuous or benevolent deeds? And then, sir, are not the claims of mother earth paramount? Who feeds the hungry? Who clothes the naked? 'Tis she, dear old soul, and it is my duty to make her shine as the morning star. The selfish nature of man has blinded him and turned his thoughts from his first and greatest duty—his duty to the fountain of all good, Mother Earth. I wish you great prosperity, for in that, the whole human family will participate. Respectfully, your friend, &c.

EFFECTS OF LIME AS MANURE.

To the Editor of the Farmers' Register.

January, 1839.

Your call upon the subscribers to the Register is too just to be resisted or derided. Original communications only can keep up an excited interest in your valuable work; good as your selections are, they belong to agriculture generally, as a science, and not to particular localities. You will however, agree, that it is a dull and irksome business to preach to unbelievers; as well might I go into my pasture and exhort my hogs not to destroy the means of their own welfare and subsistence, as to give you, for the cultivators of the land, in general, any thing about improving husbandry, if the course recommended involves any thing like immediate expense. Some of my neighbors have been induced to use clover and plaster, but were warned of the sure result, if they did not make their land dry. This did not suit them; and the result was absolute failure. Now, sir, would you believe that this gave them occasion for believing that plaster did not suit their land? Why, sir, stable dung would fail under the same circumstances.

In the last three years I have purchased forty thousand bushels of oyster shells, and some limestone from the country above Harper's Ferry. I have passed over 650 acres of land, upon which I have used about 35,000 bushels; and if I allow much for my mania upon this subject, my farm has returned me the money expended, and yet holds a surplus for farther operation. I shall not go into detail, but I hold the record of my predecessors which enables me to show that my annual produce is not less than eight times as much as theirs; and this record is for eight or ten years. I speak not of this in boast, for I blush to think that I have not done better. I began farming when young, and had none to counsel with. If I suggested to my neighbors what I expected, I could see that they pitied my folly or my ignorance. I offered my property again and again for sale; for my heart sickened with hope deferred. I remembered that that great man Moses had used up 40 years in effecting his purpose; but that he finally saw the land of "milk and honey," and I tugged still at the "tough oar." The strife was fearful; for after draining my land, it had been so long drowned that it was not productive. About the time that I had settled this fearful inquiry, I met with your 'Essay on Calcareous Manures.' I had before made two experiments with lime some years apart; but I resolved upon a third; for I saw that the land was wet upon which I had failed. This burst upon me like the sun of Austerlitz did upon that meteoric man Napoleon; and since that, more care in draining makes the lime work like a charm. If I run riot, sir, upon the subject of lime, you must give me room. I would not willingly harm any person; but to me, it is meat and bread.

---

* And which *cannot* produce the *multicaulis* mulberry, even *if it should* come up.—Ed. Far. Reg.

* * * * * * * *

I sold this season past $200 dollars worth of turnips, from one acre of land, and I assure you, sir, that until the equinoctial rain, I did not think I should make one bushel. It was passing strange to see how rapidly they grew. I made a good crop of corn from the rain we had upon 13th August; and one thing good for philosophy to know attends it in a very curious degree. It is the flint-like character of the cob or husk. I do know that timber grown in lime-stone land is much heavier than that grown in other land; is it the same with corn?

LIME.

For the Farmers' Register.

MONTHLY COMMERCIAL REPORT.

Speculation has been more active than usual, in the absence of recent intelligence from Europe.

The ascertained short crop of tobacco in this country, causes prices still to advance, and they are now about $2 per 100 lbs. higher than in December. The lowest quality of new lugs $9 to $10, and new leaf $13 to $17. Purchases are confined chiefly to manufacturers.

Cotton has also advanced about 2 cents, and may now be quoted 13 to 14 cts.. The receipts and shipments from all ports, in the aggregate, are considerably short of last year's at the same period.

There has been little variation in the price of flour. A small advance has been realized in some markets, but the current rates are still about $8¼ for all but city mills—which is held at $9. Wheat commands 165 to 175 cents.

Feb. 1, 1839. X.

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PRICES CURRENT--Feb. 6, 1839.

COUNTRY PRODUCE.

Wheat,	$1 62 to 1 70
Flour, (superfine)	8 25 to 8 50
Corn, per bushel 90 cents,	
Cotton,	12 cts. to 15
Tobacco,	$8 to $18 00
do. (lugs)	$6 00 to $10 75
Bacon, (hog round)	12½ cts.

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ACKNOWLEDGEMENTS TO CORRESPONDENTS.

The following articles are in hand, and will appear in the next No. "Essay on Vegetable Physiology," Chapters 3 and 4—"Statement of localities and constituent parts of various *marls*, or calcareous deposites in South Carolina"—"Description of a cheap marl-borer."

Advertisements which were expected to be on this cover, and do not appear there, will be found in the Country Advertiser, issued at the same time, and sent to a numerous body of other readers. When, for want of space, this change is made, without being ordered, *two* insertions in the Advertiser will be given for the one omitted in the Farmers' Register. It is presumed that the change will not be objected to, as it operates greatly to extend the circulation of advertisements.

FOR SALE BY

BRAGGS & THOMAS,

SILK-WORMS' EGGS,

Raised in this neighborhood, and of unquestionable good quality.

Petersburg, Feb. 1—n3t&a3t

MORUS MULTICAULIS,

AND

SILK-WORM EGGS.

200,000 Single Bud Cuttings at three cents each, until a farther rise.
240,000 Mammoth White Silk-worm Eggs.
160,000 Mammoth grey silk-worm Eggs.
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For sale, by J. H. D. LOWNES, Ag't.
Richmond Virginia,
Cross street leading to Mayo's Bridge.
February 1st, 1839—n3t&a3t

GRAPES.

100 Cuttings of Brown Malaga, at 50 cents each.
5,000 Cuttings of Norton's Seedling.
6,000 Cuttings of Weller's Halifax.
2,000 Cuttings of York Madeira.

Catawba, Isabella and a general variety of the most approved kinds; persons wishing to stock vineyards will find it to their interest to communicate (Post Paid) with

J. H. D. LOWNES, Ag't.
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February 1st, 1839—n3t&a3t.

FORWARDING
By the Richmond & Petersburg
RAIL-ROAD.

Goods sent by this Railroad will, if so directed, be forwarded to any point on the line of the Petersburg and Roanoke, or Raleigh and Gaston Railroads, and goods sent by those roads to Richmond, will be received from the depot in Petersburg and brought on. The depot agent at Pocahontas, will attend to the forwarding, but this company will not be liable for accidents or losses, except as at present on its own road. The freight and passage through, on goods sent from Richmond, must be paid here in advance, and on goods sent to Richmond may be paid either here or in Petersburg. A forwarding commission of 10 per cent. on the freight of this road must be paid to the agent, which will be received with the freight and drayage.

Goods will, in like manner, be forwarded to, or received from any point on the line of the Richmond, Fredericksburg and Potomac or Louisa railroads, under the care of the freight agent at Richmond.

Richmond, Feb 1.—R. tf

Mulberry Trees, &c.
FOR SALE.

The subscribers, independent of their interest in the Mulberry Nursery, &c. at Bellona Arsenal, for which, with their partner there, due provision has been made as to the fully sustaining that Nursery, the growth of Silk, &c. have still for sale whole Trees and Roots and Cuttings of the *genuine* Morus Multicaulis, or Chinese Mulberry, all and every part of which they will warrant as genuine, fully matured, and grown from Roots or Cuttings only. ☞ Not even a suspected particle will be offered for sale. They would, however, prefer selling the remaining parts of the whole Trees, the Roots and Cuttings, still undisposed of, to those persons who wish to grow them in this section of country.

In their visits to the northern states, during the past summer and autumn, they thought it best to enlarge their nurseries of the Morus Multicaulis Tree, by adding some of the most approved kinds of other Mulberry, held in very high esteem by several of the most judicious and successful growers of the north, and for that purpose bought, perhaps, more than they stand in need of for their own nurseries, of the following kinds, which are well suited for the colder climates of the north and west—*their* genuineness is warranted,

Say the Alpine,
the Canton and
the Brussa, together with
the Multicaulis, named above, that

will be sold on reasonable terms. Apply to
TH. S. PLEASANTS, Bellona, or
HENRY CLARKE, Richmond.

Dec. 1—2mreta

MORUS
MULTICAULIS,
OR GENUINE NEW
CHINESE MULBERRY.

A large stock of the *best Southern* raised, lately put into the hands of the subscriber, for disposal, at 30 dollars a thousand for buds; and 20 cents a foot for main-stem, and root; and a discount for large trade, say 5 per cent. for 500 dollars, and 10 per cent. for a 1000 dollars, or more. But as the price is still rising, owing to the very inadequate supply for the increasing demand, it is suggested, that to prevent disappointment, those not immediately applying to *secure* at above prices should expect an *advance*, and say in their order "at going rates;" again as the season is advancing and little time for negociation as to distant deliveries, against early (best) time of spring planting, it is stated that no quota, is to be forwarded until payment *first* made or *secured* at the place where ordered: say here, Enfield, Halifax, Gaston, Petersburg, Cheraw, Charleston, Baltimore, or at any place in our country, accessible by water, or rail-road conveyance.

SIDNEY WELLER.

Brinkleyville, Halifax county, N. C.
February 1st, 1839—R&A1t.

Silk Rearing Business.

The subscribers have associated themselves, for the purpose of conducting a Mulberry Nursery and the Silk Rearing Business, to be done at Bellona Arsenal, in Chesterfield Co., under the firm of RANDOLPH, PLEASANTS & CLARKE, where next season they will be prepared to purchase Cocoons. After next season they expect to be enabled to furnish the growers of Silk with Silk-worm Eggs of the most approved kinds, that they have, with much difficulty, procured for their own use for next season. They are pleased to inform the public that they have engaged the services of an assistant, who will reside at Bellona, and who is thoroughly acquainted with the care of the Worm, in all its stages, feeding, &c. as well as with the structure of the newest and most approved Cocooneries, making Silk Reels, Reeling the Silk, &c. of whom every information can be procured.

☞ Each of us have other establishments than the joint one at Bellona—these will be conducted in our proper names.

TH. M. RANDOLPH,
TH. S. PLEASANTS,
HENRY CLARKE.

Letters directed to Powell's Tavern P. O., Goochland County, Va. will meet due attention.

RANDOLPH, PLEASANTS & CLARKE.

Bellona, Dec. 1—2mreta

The editor will be obliged to any friend, to whom it may be convenient to render the service, for the loan of 4th volume of Pinkerton's Voyages, &c. which was published in numbers, by subscription, in Philadelphia, about 1811. The number containing the chapter "*Of the culture of silk in France,*" and commencing at page 569, is the portion desired.

THE

FARMERS' REGISTER,

A MONTHLY PUBLICATION,

Devoted to the Improvement of the Practice

AND

SUPPORT OF THE INTERESTS OF AGRICULTURE.

EDMUND RUFFIN, EDITOR AND PROPRIETOR.

Vol. VII. FEBRUARY 28, 1839. No. 2.

And he gave it for his opinion, "that whoever could make two ears of corn, or two blades of grass, to grow upon a spot of ground where only one grew before, would deserve better of mankind, and do more essential service to his country, than the whole race of politicians put together." ***Swift.***

PETERSBURG, VA.

PUBLISHED BY THE PROPRIETOR.

1839.

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(Continued on page iii.)

THE FARMERS' REGISTER.

Vol. VII. FEBRUARY 28, 1839. No. 2.

EDMUND RUFFIN, EDITOR AND PROPRIETOR.

For the Farmers' Register.

ESSAY ON VEGETABLE PHYSIOLOGY.

(Continued from page 17, last No.)

Chap. III.

DIFFERENCE BETWEEN THE ROOT AND STEM; 1st. IN THE DIRECTION OF THEIR GROWTH; 2d. IN THE ABSENCE OR PRESENCE OF BUDS; 3d. IN THE MANNER OF THEIR GROWTH.

Having completed our examination of the elementary vegetable structures, and of the organs formed immediately from them, viz: the cellular, woody, and vascular tissues; we will now commence our investigation into the structure, and vital action, of the compound organs of plants. These, as has been already mentioned, are divided into two classes; according as they are intended to minister to the growth of the plant, or to the production and perfection of the fruit. The first class, including the root, stem and leaves, being termed organs of vegetation; and the second, including the calyx, corolla, stamens, and pistils, being termed organs of fructification.

The root and stem, we will examine in connexion. The central part, or axis of a plant, that part to which all the other parts are attached, consists of two distinct portions; the ascending portion, or stem, and the descending portion, or root. The common definition of the term root, is "that part of the trunk which fixes the plant to the soil, and burrows beneath its surface." This definition will answer as a popular one; but if we wish to get a more correct idea of the nature of the root, it will be necessary to attend to the differences which exist between it and the stem a little more in detail.

One of the most striking peculiarities of the root is in the direction of its growth. If a seed be placed in the ground, in favorable circumstances, the embryo plant within it soon begins to grow in two opposite directions; one of its extremities manifesting an invincible tendency to grow upwards into the air and light, and the other an equally invincible determination to the earth, away from the light. If after a seed has sprouted its position in the ground be reversed, so that the stem shall point downwards and the root upwards, they will both twist entirely around, in order to develope themselves in their proper media. This fact is commonly explained by saying, that the root is attracted by the moisture of the earth, whilst the stem is attracted by the air and light. It is, to say the least, a very loose use of language, to talk about the attraction of the root, for moisture, or of the stem, for air and light. Attractions are those forces which different portions of matter exert on each other, tending to bring those portions together. If a particle A, be attracted by another particle B, of equal size, the force exerted is as much exerted by A as it is by B; and the tendency of A to move is no greater than that of B. If one of these bodies be in any way fixed, it is plain, that all the movement must be made by the other. Such are, in fact, the circumstances in which the young root of a plant and the moisture of the earth are placed. The young root is fixed, whilst the moisture is moveable. If then there is an attraction between the two, the moisture should move up towards the root, and not the root down towards the moisture. The same remark will apply with even greater force to the supposed attraction between the stem, and the air and light. One of the facts which is most frequently brought forward in support of this notion of attraction is, that when a plant is placed in a dry and barren spot, in the immediate neighborhood of a more moist and fertile one, its roots are always found to increase more rapidly in the direction of that moist and fertile portion than in any other. This, as we shall hereafter see, is not owing to any attraction exerted by the moisture upon the roots, but to an entirely different cause.

This matter has been put to the test of direct experiment. Dutrochet filled a box with moist earth, and having pierced the bottom with many holes, he placed within the box, and near to its lower surface, a number of beans, and then suspended it in the air about eighteen feet from the ground. The seed being thus situated, it should follow, that if the young stem is attracted by the light, and the root by moisture, the former should shoot downwards into the air, and the latter upwards into the moist earth. This, however, did not take place; but, on the contrary, the radicles descended into the atmosphere, where they soon dried up and perished; whilst the stems ascended vertically, forcing their way into the earth. He then placed some of the small plants so that their roots pointed directly up into the soil; but instead of fixing themselves therein, their points soon turned around, and grew in an opposite direction. Supposing that possibly the quantity of earth might affect the direction of their growth, he afterwards made use of a much larger box, and accumulated a very considerable mass of earth above the seed, but the result was the same as before; thus proving that the stem is not attracted by air or light, neither is the root repelled by light or attracted by moisture.

That the radicle is not attracted by moisture, the same naturalist afterwards proved more directly by another experiment. He suspended in a glass jar a piece of sponge, so placed as to present a flat verticle surface in one direction. One end of this piece of sponge was made to dip into a cup of water, so that it might always be kept filled with water. He then suspended within the same jar, a germinating bean; bringing its radicle as near to the verticle face of the sponge as was possible, without touching it. In this case, if any attraction had been exerted upon the root, by the moisture of the sponge, a slight turn of the former would have brought them in contact. The radicle, however, grew perpendicularly, manifesting no tendency to turn towards the sponge. The true explanation of this matter appears to be this: that as roots lengthen, by the addition of new matter to their extremities, in a soft or semi-fluid state, they grow downwards, under the action of the attraction of gravitation.

The young stem, on the contrary, growing by the increase of parts already formed, has from its first developement, a tendency to grow in the direction in which the bud points. If, in consequence of the buds pointing obliquely, the young stem shoots in an oblique direction whilst yet beneath the surface of the soil, the juices accumulate on the lower side, and thus causing it to elongate more rapidly than the upper side, the erect position of the stem is restored. The bud from which the stem grows contains every part of that stem, and all its appendages, in miniature. If the axis of this bud, i. e. the stem in miniature, points perpendicularly upwards, and its after-growth is effected simply by the enlargement of these points, it is plain, that the stem must have the same direction as the axis of the bud; or, in other words, must grow in the direction in which the bud points. The root does not grow from a bud, but increases in size by the addition of separate portions of semi-fluid matter to its extremity; it will, therefore, increase downwards, for just the same reason that an icicle does. If this explanation be the correct one, it will follow, that when, in a germinating seed, the root happens to point directly upwards, and the stem directly downwards, the two parts should grow in these directions; yet, being in a state of unstable equilibrium, the slightest variation from a vertical line would cause them in time to resume their proper directions. In confirmation of this view, De Candolle placed a hyacinth in water, and having fixed its bud so as to point directly downwards, caused its stem to develope in that direction.

Mr. Knight, to whom we are indebted for this explanation of the downward tendency of the root, has tested its correctness by the following very ingenious experiment. He constructed a wheel, and on its circumference fastened a quantity of moss. In this moss he placed a number of beans; and by means of a stream of water, which served at the same time, to moisten the seed, the wheel was made to revolve vertically, at the rate of 150 times in a minute. In this rapid revolution, the seeds were subjected to the action of a centrifugal force, acting in the same manner as gravity; but much more powerfully, and in a different direction. After some days, the wheel was stopped, and on examining the growing seed, it was found that each young plant, had taken the direction of the radii of the wheel, the root being turned directly from, and the stem directly towards the centre of revolution. This experiment was varied, by causing the wheel to revolve horizontally; and the result was, that when the wheel revolved with a moderate velocity, the roots were directed obliquely downwards and outwards, and the stems obliquely upwards and inwards; in obedience to the joint action of the centrifugal force and the attraction of gravitation. The more rapid the revolution of the wheel, the nearer did the axis of the plant approach to a horizontal direction; but when the wheel revolved slowly, the attraction of gravitation preponderating, the young plants grew in a nearly vertical direction. The only objection which I have ever heard urged to this explanation, is this: if the root descends by the action of gravity, how is it that the lateral divisions of the root often grow in a direction nearly horizontal? In answer to this, I would say, that the lateral divisions of the root grow horizontally, because they meet with some obstruction to their perpendicular growth. The longest horizontal roots are generally to be found lying between the loose porous soil and the harder and more compact substratum of earth beneath that soil; and they grow in that direction, for just the same reason, that the water (which certainly descends under the action of gravity) collects to a greater or less extent, in a horizontal sheet, at the same place.

Some parasitic plants, such as the common misletoe *(viscum verticillatum)* furnish the only real exceptions to this rule. These direct their roots, (if indeed they can be called roots) towards the stem of the plant on which they grow; and always grow nearly at right angles to the part of the stem to which they are attached. The nature of the body, does not affect the result. The seeds of the misletoe, if made to germinate upon the surface of a common ball, will turn all their roots towards the centre of that ball. The attraction of the body to which the mistletoe fixes itself, cannot be admitted even in this case, as the cause of the direction which the roots take, as Dutrochet has shown by the following experiment. "I glued" says that distinguished botanist "a germinating seed of the mistletoe to one end of a delicate copper needle, mounted upon a pivot, a little ball of wax being placed as a counterpoise upon the other extremity. I then placed by the side of the needle thus prepared, a small block of wood, at the distance of about a millemetre (nearly one-twentieth of an inch) from the radicle. The apparatus was next covered with a glass shade, so that no external cause could disturb the needle. In five days, the young plant began to direct its radicle towards the piece of wood, the needle not changing its position, although it was extremely moveable. In two days more, the radicle was directed perpendicularly to the block, the point being in contact with it, and yet the needle had not moved in the slightest degree." On this experiment it is sufficient to remark, that had any attraction been exerted by the block, upon the root, instead of causing the end of that root to be turned up, and sustained in a horizontal direction, it should have caused the needle to move around, so as to touch the block. The reason why the roots of a parasitic plant turn towards the stem of the plant on which it grows, we must at present look upon as one of the secrets of nature. Perhaps at some future day, when vegetable physiology has been more studied, and is better understood, we may be able to explain the mystery. Except in the case of parasitic plants, the root shows an invincible tendency, to grow downwards into the soil, whilst the stem, shows an equally invincible tendency to grow upwards into the air.

A second peculiarity of the root is, that it forms no buds, whilst the stem always forms them. As roots form no buds, and of course develope no leaves, they present neither scales, which are the rudiments of leaves, nor scars, which are the vestiges of them. These remarks, however, are to be understood as applying to roots and stems in ordinary circumstances only. In extraordinary circumstances, the roots of some plants have the power of forming buds, which are hence termed adventitious buds. So also the stem, which, in ordinary circumstances, has not the power of putting forth roots, in extraordinary circumstances, does furnish itself with adventitious roots. It is well known, that when the trunk of a Lombardy poplar *(populus dilatata)* is cut off near to the ground; and even in some instances, where the trunk is not cut off, but parts of its roots project above the surface, those roots will produce buds and young shoots, in abundance. It is also well known, that if a stalk of the weeping-willow *(salix babylonica)* be cut off, and stuck in moist ground, it will soon form adventitious roots, and become a tree as readily as if raised from the seed.

Du Hamel performed a singular experiment upon a young willow. He bent the trunk, so as to bury the extremities of the branches in the ground; after these had taken root, and had established themselves in their new situation, he uncovered the true roots, and elevated them into the air; thus turning the tree upside down. The roots, adapting themselves to their new situation, produced buds and leaves; whilst the former branches took the place of roots. We must not, however, infer from this, that roots and branches are mutually convertible into each other. The branches in this case were not changed into roots, by being buried in the earth, nor even the roots changed into branches, by being elevated into the air; but the buried branches, gave rise to adventitious roots, whilst the roots, in the new and extraordinary circumstances, in which they were placed, gave rise to adventitious buds. This power of forming adventitious buds, is peculiar to the roots of some plants, and not common to those of all. The roots of the silver fir of Switzerland, will sometimes live for half a century after the stem is destroyed, but will never sprout again; whilst the roots of the Lombardy poplar, will put forth buds almost as readily as the stem itself.

A third distinction between the root and the stem is to be found in the manner of their growth; the stem always manifesting a tendency to grow with perfect regularity, whilst the root never does. In this particular, the stem and the root are admirably adapted to the different media in which they develope themselves. Burrowing beneath the soil as the root does, and having to make its way in an unequally yielding medium, now having its progress stopped on one side by a rock or some other hard substance, and then on the other side, it would have been impossible for it to have grown with perfect regularity, even had provision been made for such a growth. But not so with the stem; shooting as it does up into the air, it can increase equally well in every direction. If we examine a young shoot of any plant, as the dog-wood (*cornus sanguineus*) for instance, at the close of its first year's growth, we will find its leaves disposed with perfect regularity. In the plant selected they are placed in pairs, and regularly alternating with each other, as to the sides of the stem on which they grow. If the first pair point north and south, the second will point east and west, the third north and south again, and so on. The buds, which are in fact the rudimentary branches of the next year, are formed only at the points at which the leaves are joined to the stem, and of course must be placed on that stem with the same perfect regularity which characterizes the disposition of the first year's leaves. The same remarks will apply to the branches of each succeeding year. If a plant could grow, entirely exempt from the operation of all disturbing causes, it would be as perfectly regular as if put together by the hand of art, with the square and compass. The only reason why plants never do present this appearance is, that they always are affected, more or less, by certain external causes, which disturb their growth.

I will mention some of these disturbing causes, and illustrate their operation. We will suppose that a plant, during the first year of its life, has formed eight buds, and that each of these is packed away under its sheath of scales, in order to stand the storms of winter. The sheaths are seldom so formed as to be a perfect protection against water. It is almost always the case, that if a drop of rain happens to strike them precisely upon the tip, it will penetrate into the bud. If after such an accident has happened, a cold night occurs, this water will freeze, and thus, the bud, and all that in other circumstances would have sprung from it, will be destroyed. It frequently happens, that of the buds formed one season, not more than one-half live to open and grow the next spring. Now, it is very improbable, that if one-half of eight buds be thus destroyed, they will be either the first, third, fifth, and seventh, or the second, fourth, sixth and eighth; and yet all these would be necessary in order that the plant may retain a perfect regularity of form.

Again: there are many insects which by instinct are taught to pierce the stems of plants in order to deposite their eggs. Whenever this is the case, the part thus pierced swells up, and disorganization, to a greater or less extent, ensues. The nutgall, the green balls which we often see on the leaves of the oak, and the excrescences which we see on the stems of plants, are all produced in this way. If we suppose that the wound inflicted by the insect exerts no positively deleterious influence upon the growth of the plant wounded, yet, as an excrescence is formed, a part of the nutritious matter, which, in ordinary circumstances, would have gone to increase the size of the limb, is necessarily employed in the formation of the excrescence; and of course the limb must suffer in size on this account. Thus, an irregularity in the form of a plant may be produced.

Again: we know that direct sun-light is necessary to the healthy growth of a plant. So soon as a tree has grown to some considerable height, its upper branches shade those beneath them, and thus induce in them a diseased growth, and even death itself. All are famillar with the fact, that what is commonly called the trunk of a tree, seldom presents any branches. This is not because it did not send out branches in the first instance, but because the branches which it did form have been overshadowed and destroyed by those growing higher up upon the stem. In the case of a species of pine common in lower Virginia, the branches of which are early filled with resin, and on that account do not easily decay, a series of dead branches may be seen stretching from the root up to the living branches of the tree. Trees growing in the forest, where they are shaded by the surrounding trees, seldom present many lateral branches, except towards the top; whilst those growing in the open field, where the sun-light has free access to them on every side, generally spread their branches far and wide.

Again: a young shoot may be bent by the wind; if bent but little, its elasticity will generally restore it; but, if bent much, it receives a permanent crook, and thus an irregularity is produced. The same effect may by produced by snow and ice, which, in the winter, frequently accumulate upon young trees, and the young limbs of trees, and bend them towards the earth. Thus it is, that though there is a tendency in trees towards a perfect regularity in growth, so that if they could be freed from the operation of all disturbing causes, they would appear as if morticed together by the hand of art, and would be in their outlines perfect cones, yet we never see them presenting this regularity of form.

There are one or two facts respecting the operation of these disturbing causes, which are worthy of a passing notice. One of them is, that most of them operate more powerfully in the winter than in the summer. To this, as well as to the fact, that they are longer exposed to this operation, must be attributed the far greater irregularity which we observe in perennial than in annual plants. The catnip, (*nepeta cataria,*) which has none of these disturbing causes to contend with, except those which operate in the summer, and these only for a short period, presents but slight deviations from its regular form; whilst the oak, which lives from year to year, and from age to age, bearing the storms of a hundred winters, is well characterized as the "gnarled oak." Another fact worthy of notice is, that although the operation of these causes seems to be in the strictest sense accidental, so that we can assign no reason why one bud should be destroyed rather than another, or why an insect should sting one branch rather than another; that yet their destroying effect is so managed as to be consistent with a general regularity of growth. About as many buds are destroyed on one side of a tree as on another. Seldom, if ever, do we meet with a tree so lop-sided (to use an unauthorized but very expressive word,) as to endanger its stability. Although a tree is very irregular in the minutiæ of its growth, yet it is regular in the midst of all its irregularity.

CHAP. IV.

PRINCIPAL OFFICE OF THE ROOT. SPONGELETS. BIENNIAL ROOTS. COLLAR OF PLANTS. UNDER-GROUND STEMS, THEIR NATURE AND STRUCTURE.

Having attended to some of the more important characteristic features of the root, we will now examine that organ a little more in detail. The root of the garden bean (*vicia faba*) may be assumed as the type. The root of this plant consists of a main stem, irregularly divided, and subdivided, into what are called the branches of the root, or rootlets. From this, which is by far the most common form of the root, we meet with many departures. The root of the carrot, (*daucus carota*) consists of a mass of vegetable matter, of a conical form, and having all its rootlets at its lower extremity. In the turnip (*brassica rapa*) this mass is nearly globular in its form. Most grasses have no regular main-root, but a number of rootlets starting from one common point, the base of the stem. Lichens have no regular root; but the whole of the lower surface of their leaves, lying in contact with the ground, or rock, or bark on which they grow, absorb nourishment for them, and thus perform the office of roots. There are many modified forms mentioned by botanists; but as they are very uncommon, it is not worth the while to mention them, when our object is an examination into the physiology of plants.

The principal office of the root, is to absorb nourishment from the soil. This absorption is not effected by the mass of the root, and throughout its whole length, as is generally supposed, but by a peculiar class of organs, situated along the smaller sub-divisions, or rootlets only. It is somewhat difficult to get a distinct view of these organs. So long as the root remains buried in the moist earth, they are distended by the liquids which they contain, and which they absorb rapidly from the soil. In order to fit them for the performance of their appropriate work, they have necessarily been made permeable to liquids in the highest degree; and hence, when taken out of the ground, and exposed to the dry atmosphere, suffering these liquids to pass out, with the same facility with which they passed in, they soon shrivel up, and lie so close to the main root, as to be with difficulty distinguished from it. The easiest way to get a sight of them, is to place the root of a growing plant in water, which in this instance, may be considered a transparent kind of soil; in such circumstances they quickly become distended, and stand out visibly from the side of the rootlet. From a similarity in the structure of these organs, as exhibited under the microscope, as also in their manner of action, to little sponges, they have received the name of spongioles or spongelets; and by this name we shall hereafter mention them.

That roots absorb nourishment solely by means of their spongelets, Sénebier has proved, by the following simple experiment. He took two young radishes (*raphanus sativus*) from the ground, with their stems and leaves; one was so placed that its apex only (the part on which the spongelets are situated) dipped in water; the whole root of the other was plunged beneath the surface of the water, excepting the apex, which was exposed to the air. The leaves of the former, remained fresh for several days, whilst those of the latter soon began to wither, and only recovered their freshness, when the extremity of their root was immersed. This is an experiment which has been frequently repeated, and always with similar results.

The form of the sponglets of plants, which derive their nourishment immediately from the soil, is always spherical or spheroidal. In that curious class of plants termed parasites, (of which the misletoe may be mentioned as an example,) which instead of searching in the earth for their own food, fix themselves upon the stems of other plants, and live by robbing, the spongioles have the form of disks; thus fitting them to fasten themselves to the stems of other plants, and also to absorb the greatest quantity of nourishment from those plants. Spongelets in this form, fasten themselves to the stems of plants, in just the same way in which children fasten moist pieces of leather to stones, in order to lift those stones.

Spongelets as I have already remarked, are situated only along the smaller sub-divisions of the root. A knowledge of this fact, will suggest several rules to be observed in the cultivation of plants. First, when manure is used to assist the growth of a young tree, or of any plant which spreads its roots to some distance, the manure should not be placed at the point where the stem enters the ground, but at some distance from that point, and as nearly as possible over the extremities of the roots; because it is at these parts, and these alone, that the roots can absorb the nourishment furnished by the manure. Second, when a vine is to be set out near a tree, in order that it may be supported by that tree, it should be set close to the trunk, rather than at the distance of several feet from it, because if set at the distance of several feet from the tree, its spongelets will have to absorb nourishment from the same portion of earth as those of the tree, and thus the two will interfere with each other's growth; but, if placed near to the tree, the spongelets of the two will operate upon different portions of earth, and of course will not interfere with each other. Third, as what is commonly called the soil is the portion of earth which furnishes nourishment most abundantly, it is advisable to cause the roots of a plant to spread horizontally, rather than perpendicularly; to keep them in the soil, rather than to suffer them to penetrate beneath it. This the German gardeners effect, in the case of fruit-trees, by placing a flat stone in the bottom of the hole in which the trees are to be set, and then setting the young tree directly upon this stone. There is only one precaution to be observed in adopting this method, and that is, not to place the flat stone too near the surface, least the roots should not take sufficient hold upon the ground, to enable the tree to resist the action of high winds. The best point at which the roots of a tree can spread, is along the lower surface of the soil. The reason for this we shall see, when we come to examine into the nature of the sap. Fourth, in transplanting trees we should take great care of the rootlets, or smaller sub-divisions of the root, as these are the efficient parts of that organ. If the root have several branches, it is better to cut off all those branches excepting one, and to retain that one with all its sub-divisions perfect, than to cut off the ends of all the branches, as is the common practice. I have heard of an excellent plan, sometimes pursued in transplanting the *arbor-vitæ* or flat cedar, (*thuga occidentalis*,) a tree which it is very difficult to move without killing. The plan is this. During the spring preceding the autumn or winter when the young trees are to be removed, the roots are all cut off at a convenient distance from the stem, (a foot or eighteen inches will be sufficient if the tree is small) by striking a sharp spade in the ground, at the point where they are to be cut. The tree is then left standing for the summer; during this time the branches of the root, being deprived of the greater part of their rootlets, will form others in great numbers, and of course all of these will be situated near the stem, and will be easily removed with it. Whenever a young tree is removed according to the method ordinarily pursued, it of course has to form almost an entire set of new rootlets, before it can be prepared to operate to advantage in its new situation. Besides this, it has to establish the rootlets which are left attached to its stem, in a new place. The effect of both of these operations, is to check the growth of the plant. Sudden and great checks, are always much more injurious to the growth of a plant; that slighter checks, though they operate for a much longer time. The advantage of the plan which I have mentioned, over the common plan lies in this; that a slight check continued for some time, is substituted for a sudden and great one. Fifth, as rootlets, and more especially spongelets, are delicate organs, and of course easily broken, it is much better to take up at least a portion of earth with the root, than violently to shake all the earth off. Where the earth is shaken off, or the plant pulled up, instead of dug up, a great many of the rootlets are always broken off, and of course the growth of the plant is checked. It is an excellent plan, to remove young trees whilst the ground is frozen hard around their roots. In such circumstances, the earth which is attached to the root, seldom breaks off, and thus, all destruction of the rootlets is avoided.

Both of these plans last suggested, have, to my own knowledge, been pursued with evident advantage. In the case of trees, such as the *arbor-vitæ*, which it is difficult to remove without killing, they should always be pursued; in the case of many trees, trees of easy growth, it does not seem to make so much difference; yet, even in the case of these, there can be no doubt that it does make a difference. There is always a best way of doing every thing; and if we would expend our labor to the greatest advantage, we should always endeavor to ascertain this best way, and if it be but a little more difficult or laborious than an inferior one, always pursue it. It is by attending to little things that great things are accomplished; and more especially is this true with respect to improvements in agriculture. Besides this, it should always be borne in mind, that a difference which may be inconsiderable in the case of a single plant, may become one of great importance in the case of a crop, consisting, as many of our common crops do, of thousands and tens of thousands of plants.

There is a fact, with respect to biennial plants, which is worthy of notice. Biennial plants are such as require two years to attain their full growth; or such as bear their seed the second season after they are planted. During the first year of their growth, their vital energy is expended in the formation and enlargement of their root, and in filling its cellules with nutricious matter. During the second year, their roots undergo no increase of size; but the whole of the nutritious matter collected in them during the previous year's growth, is expended in perfecting the stem and seed. All are familliar with the fact, that whilst the root of a common beet (*beta vulgaris*,) affords a great deal of nourishment if taken at the close of its first year's growth, it is good for nothing after the plant has gone to seed. The reason of this is, that when we delay until at the close of the second year, the plant anticipates us, and we get nothing but the dry empty cellules, or boxes, from which the nutritious matter has been already removed.

The most important office of the root, is that which I have already mentioned, viz: to absorb nourishment from the soil. When a plant first springs into independent being, it sends one single stem upwards, and a single root downwards. As the stem spreads, the root also spreads. As the twig of one year the next year becomes a branch, so the rootlet of one year the next year becomes a root; and thus the two go on increasing proportionably in size. As these two parts of a plant are intended to operate together, the one furnishing the material and the other working it up; in a healthy state of a plant, they will always preserve their relative size. It has sometimes been made a question, whether it was advisable to lop the branches of a tree when we transplant it. If the ends of the roots are cut off, as is commonly the case, I should decide the question in favor of lopping the branches also; and perhaps even where the roots are not cut off, as their action is checked to a certain extent by being placed in a new situation, it may be advisable to lop the branches to a small extent. The only other office of the root, which I shall mention at present, is that of fixing the plant in the ground, and thus enabling it to rear its stem in the atmosphere, and spread abroad its leaves, so that under the action of sun-light, they may be enabled to perform their appropriate functions.

Between the root and the stem there is no definite organic separation, but the two melt, as it were, together. Nevertheless, the imaginary line formed by their union, has received the name of collar or neck, and great importance has sometimes been attributed to it. A very common impression is, that the collar is the seat of vitality; and that if a tree be cut through at its collar it will never grow again. If such trees as the pine and the oak, be cut off at the level of the ground, it is true, that they never will sprout up a second time; but there are other trees, such as the Lombardy poplar and willow, which may be cut directly through the collar, or even below it, without preventing the part which remains from shooting forth young stems, to take the place of those which have been removed. This proves that the opinion that the collar is the seat of vitality, is an erroneous one. The fact that many trees, when cut off at the surface of the ground, are effectually killed, whilst others are not, is to be accounted for in a different way. As I have mentioned in a previous chapter, the roots of some plants have the power of forming adventitious buds, and thus giving rise to stems, whilst others are entirely destitute of this power. If a plant of the first kind is cut off at the surface of the ground, and its root is suffered to remain in the soil, that root is placed in the most favorable circumstances for developing adventitious stems. If a plant of the second kind be treated in the same way, as its roots are incapable of forming adventitious buds, it is of course effectually killed. That the collar is not the seat of vitality, those farmers whose land are over-run with sassafras, (*laurus sassafras*,) must have found out to their sorrow.

In stating that the roots of plants do not, except in extraordinary circumstances, form buds, it is necessary that I should point out a distinction, which botanists make, between true roots and under-ground stems. Of these underground stems, the tuber of the potato, (*solanum tuberosum*,) or what is commonly called the potatoe itself, may be mentioned as an example. These always form buds. They are distinguised from true roots by the formation of buds; and from true stems by the character of their buds; for whilst the buds of true stems send forth branches only, the buds of underground stems always send forth both roots and branches. It is necessary, both for the sake of exactness of language, and for practical purposes, carefully to distinguish between these two classes of organs. For whilst an under-ground stem is one of the means destined by nature for the multiplication of plants, true roots never perform this office except in circumstances special and very unusual. Neither do such stems appear to perform the office of roots. They seem intended to act a part similar to that of seed, their buds taking the place of the embryo, and their mass the place of the parenchyma of the seed. Like seeds, they are destined to give rise to new individuals of their species, and to furnish them with nourishment, until their roots are sufficiently developed to perform that office. Hence it is, that before sprouting, they are filled with nutritious matter, and form a very important article of food; but after sprouting they are shrivelled and dry, consisting, like the roots of biennial plants after their second year's growth, of nothing more than empty cellules, which the growing plant has exhausted of all nutritious matter; and hence too it is, that a potato, although not buried in the earth, will sprout and grow very well, so long as the nutritious matter which it contains lasts, but so soon as that is exhausted, will die.

Under-ground stems present a very considerable variety, both in form and in structure. The tuber of the potato is generally more or less globular in form, and always homogeneous in structure; the cormus of the tulip is far more regular in its shape than the potato, but like that, is homogeneous in its structure; the bulb of the onion has the same shape as the cormus of the tulip, but instead of being like that, homogeneous in its structure, it consists of a number of concentric bands, easily separable from one another. The botanist considers these as modified leaves; the scaly bulb of the lilly is more evidently made up of modified leaves. The root-stock of the sweet-flag, (*acorus calamus*) which presents us with still a different form of under-ground stem, is a thick-jointed stalk, sending forth shoots and roots from every separate joint. These are some of the common forms of under-ground stems; there are others which are more uncommon, and which it is hardly worth our while to notice on the present occasion.

The wild onion, or garlic, (*allionia vineale*,) forms its bulbs at the top of its stem, among its flowers and seed; the orange lilly, (*lilium bulbiferum*,) a plant common in gardens, forms its bulbs at the points where its leaves are joined to the stem; the common white lilly (*lilium candidum*,) forms its bulbs at the base of the old bulbs, and not from the roots; and the potato in like manner forms its tubers at the extremities of short under-ground branches, as is evident from inspection during the forming state of tubers, and not upon the roots, as is commonly supposed. By particular management, De Candolle states, that he has caused potatoes to form on the ordinary branches of the plant, and even at the axils of the leaves. That the tubes are formed upon the under-ground branches, and not upon the roots of potatoes is a fact which should be borne in mind, in attempting to determine the best manner of cultivating that vegetable. The circumstances which seem most favorable to the developement of these under-ground branches on which the tubers form, are, the exclusion of light and a proper degree of moisture. If the light be not excluded, the branches, if developed at all, will be like the common branches of the plant; if there be not sufficient moisture present, the branches will not form at all. The circumstances which seem most favorable to the production and perfection of the tuber, are, the exclusion of light, a proper degree of moisture, and protection from the intense heat of the sun. The effect of light upon the tubers, is to render them green and bitter, by converting their nutritious matter into matter similar to that of which the leaves of the plant are composed. The want of moisture prevents the full developement of the tuber. The effect of the intense heat of the sun is to harden the tissues of the tuber, so as to unfit them for the performance of their office. Besides this, it is important that the soil, or whatever it may be in which the tubes grow, should be so loose as not to oppose any obstacle to their increase in size. It should also be borne in mind, that the tubers derive nourishment from the soil, not immediately, but through the true roots.

With these remarks, I will venture to propose what *I* should consider the best plan for cultivating potatoes. Let the ground be prepared in the ordinary way; lay the potatoes in the bottom of the furrow, and cover them to a depth of three or four inches with coarse manure, or leaves, and then with two or three inches of earth. After the stalks are six or eight inches above the ground, cover all except their ends under in the same manner; and perhaps, this process may be advantageously repeated a third time; after which they should be suffered to go to seed. The first covering should, unless the land be very rich, consist in part of manure, in order to furnish nourishment to the plant; the second and third, may consist of straw or leaves, as the principal object is to keep the earth loose, and to protect the tubers from the action of the sun. It is not, perhaps, generally known, that there is no more effectual protection for ground, against the intense heat of the sun, than a covering of dry leaves. Where they cover the ground to the depth of three or four inches, on removing them, even in the hottest weather, you will find the ground moist under them. Hence it is, that they assist a crop of potatoes, even where they are not covered with earth, so as to cause more tubers to form amongst them. I have never known potatoes to be raised in just the manner which I have proposed, but in many instances, I have known them to be raised, in methods somewhat similar; and so far as my observation has extended, the nearer the method adopted has approached to the method which I have proposed, the better the crop has been. I have known an excellent crop of potatoes to be obtained by simply laying the seed-pototoes in a furrow, and covering them to the depth of a foot or more with dry leaves and straw. Many farmers are in the habit of covering their potatoes with loose sod instead of simple earth, always turning the grass side of the sod under, so as to prevent its sprouting; and very good crops are raised in this way. But whatever plan we may adopt, a knowledge of the nature of the tuber, and of the manner of its growth, would suggest that it should be kept sufficiently moist, should be protected from the light and intense heat of the sun, that the earth around it should be kept loose; that the lower part of the stalk should be covered under after it has grown to some considerable height; and that the manure which is intended to assist the growth of the plant, should be placed around the true roots, and not the tubers, as these last, like the other parts of the plant, derive their nourishment through the true roots.

(To be continued.)

MEMOIR TO CONGRESS ON THE BEET CULTURE.

To the honorable the Senate and House of Representatives of the United States of America in Congress assembled:

The memorial of Charles Lewis Fleischmann, a naturalized citizen of the United States,

Respectfully represents:

The existence of crystallizable sugar in the beet-root was discovered by the German chemist Markgraf, in the year 1747. He communicated the results of his experiments to the Royal Academy of Sciences at Berlin; pointed out the importance which his discovery would have on agriculture and industry, and endeavored to bring it into practice; but at that time, the price of sugar being moderate, chemistry not advanced to modify the complicated operations, and the spirit of enterprise not sufficiently awakened to make it an object of speculation, the discovery remained without being put into practical use until the year 1796, (forty-nine years afterwards,) when Achard, another Prussian chemist, repeated the experiments of Markgraf, modified them, and erected the first manufactory at Kunnern, in Germany.

The results of Achard's manipulation created great sensation all over Europe, particularly in France, where the chemists re-examined the process of Achard, simplified it, and made it more practicable and profitable in its results.

These simplified manipulations were adopted by enthusiastic speculators, full of sanguine expectations, peculiar to the French character; but the results were not satisfactory, as the immensely large and costly manufactories were partly established in places where the soil was not sufficiently productive, where fuel was scarce and high, the market distant, and the operations directed by men, who had not the least idea of agriculture—a science necessarily connected with the manufacture of the beet-sugar—nor practical knowledge of an entirely new process, and a most imperfect apparatus. The consequence of these obstacles was a complete failure, which induced the opinion over the whole world, that the extraction of sugar from the beet, though correct in theory, was impracticable on a large scale.

This, however, was not the opinion of enlightened men; they saw the causes of failure in their true light, and endeavored to overcome and to correct them. The political events of 1812 accelerated the developement of this new branch of industry; the French government, in want of a substitute for the colonial sugar, encouraged the manufacture of the beet-sugar, by establishing four large manufactories, and teaching the best method of extraction.

In 1814, these manufactories were in full operation and flourishing, when the peace of Europe allowed the importation of the colonial sugar into France, causing a destructive shock to the manufacturers of indigenous sugar, which none but immense fortunes could endure, and created, again, the belief that the manufacture of the beet-sugar could never come in competition with the colonial.

This might have been the final catastrophe of the manufacture of the beet-sugar, had it not been for the efforts made to revive it again by some wealthy and enlightened manufacturers.

These efforts, however, did not arise entirely from the patriotic desire to promote the welfare of France, (as now pretended,) but partly to prevent the loss of immense capitals invested in buildings, apparatus, farms, &c. Moreover, the manufacturers knew there was yet five or six per cent. more to gain by an improved operation.

This it was that gave a new start to this favorite branch of industry; and chemistry, particularly adapted to improve the art and manufacture, assisted in simplifying the process, and discovered the mode of *reviving* animal charcoal so as to admit of its being repeatedly used, while the improved apparatus helped to economize labor and fuel; and all this, combined with a wonderful perseverance, reduced the expenses of the fabrication, and enabled the old establishments to continue in operation, even when the price of colonial sugar was very low. This created confidence and a rapid increase of establishments.

The cultivation of the beet has had the most beneficial influence on agriculture; as, in the last year, more than eighty thousand acres of land were planted in beet, producing about one million of tons of this root; and, as generally rotations of four crops are adopted, it brought at least three million two hundred thousand acres of land under the highest cultivation.

The following table shows the rapid increase of the manufactories, and the quantity produced, in France.

In 1828 there were 103 manufactories, which

		Beet-sugar.
produced		100,000 cwt.
1831	200	220,000
1836	543	960,000
1837	600	1,000,000

Or 20,000 tons of beet-sugar.

The manufacture of indigenous sugar did not affect the demand for colonial sugar, as the consumption continually increased until the year 1836, as appears by a table from the Journal of Commerce of 1836, viz:

In	Consump. of colon. sugar.	Con. of beet-sugar.
1825	61,255,232 fr.	4,000,000 fr.
1831	67,542,792	10,000,000
1832	62,669,638	15,000,000
1835	69,000,000	30,000,000

But, in the year 1336, France imported only 75,120 tons of colonial sugar—a diminution of 15,630 tons in one year; a *quantum* too large not to alarm the proprietors of the sugar plantations in the French colonies, and particularly in Martinique, who looked, some years ago, with an ironical smile at the beet-sugar manufacturer. They, who have ridiculed and caricatured every improvement in this branch of industry, felt themselves forced to send, in 1835, Baron de Cools, with the following proposition of the French government, viz: demanding—

1. Diminution of the duties upon French colonial sugar of 50 per cent., and a proportional reduction of duties upon the foreign colonial sugar.

2. The permission to export the colonial sugar direct to a foreign market.

3. A careful examination and investigation how the French colonial and beet-sugar manufactories can be equally taxed.

The latest news from France states that the government came, finally, to the conclusion of an equal taxation upon the indigenous and colonial sugar, as may be seen from the following extract from a New York paper, (Morning Courier and New York Enquirer of December 18, 1838,) dated

[By the Ville de Lyons]

Paris, October 30, 1838.

"A branch of industry, (the offspring of necessity under the empire,) the production of sugar from beet-root, has engaged much attention in France, and has been carried on with success, and to a vast extent. The natural consequence has been, that sugar, the produce of the French colonies, which is burdened with a very large duty on importation into France, *was beaten out of the market.* Appeals were made by the *suffering colonists* to the government, repeatedly, representing the distress into which they had fallen from this circumstance; the irremediable ruin that would necessarily fall upon them if the present tariff were maintained, and soliciting relief. After a variety of expedients to evade a decision on the point, the government has just come to the resolution of proposing to the chambers, (which are to meet on the 21th December,) to reduce the import duty on colonial sugar by 8¼ francs per cwt., which, with a precisely similar excise duty levied on the beet-root, or home-grown sugar, will, they say, suffice to re-open the market to the colonies."

Such is the state and results of the indigenous sugar mnufacture in France.

What is the progress of this branch of industry in the other parts of Europe?

England, (the mother of colonies,) which was very much prejudiced against the manufacture of indigenous sugar, seems to see, in the adoption of it, the only means of improving the physical and moral condition of man in her colonies; and she has already overcome some of her prejudices, and has begun to establish manufactories. The following article, taken from the London Mechanics' Magazine of 1836, (No. 169,) will show its progress:

"A refinery of sugar from the beet-root is being erected at Thames Bank, Chelsea, which, it is expected, will be in operation in about six weeks. In the vicinity of the metropolis, during the past summer, a great many acres of land have been put into cultivation with the root, at Wandsworth and other places. The machinery will be principally on the plans of the vacuum-pans, and *a pure refined sugar* will be produced from the *juice* by the *first process of evaporation*, after it has simply undergone the process of discolorization. Another part of the premises is appropriated to the manufacture of coarse brown paper from the refuse, for which it is extensively used in France. In case the goverment do not interfere, and, by rendering the product excisable, retard or prohibit its manufacture, several individuals have it in contemplation to establish refineries in different parts of the kingdom for purifying sugar, which may be produced in agricultural districts for domestic or foreign use. A refinery has lately been established at Belfast, in the vicinity of which town upwards of two hundred acres of land have been put in cultivation with the beet-root for the manufacture of sugar."

Russia, which adopts every useful improvement in manufacture, has, in the southern departments, large manufactories of beet-sugar, by which she expects to furnish some of the Asiatic markets with this article. So have Bohemia, Hungary, Austria, and Switzerland large beet-sugar manufactories, in the most flourishing condition.

The Germans, though the discoverers of the crystallizable sugar in the beet-root, until 1836 made very little progress in its manufacture. This is to be ascribed as well to the continual war with France, which checked every improvement, as to the uncertainty of the business itself. The Germans, well aware and well informed of every improvement made abroad, never found it sufficiently lucrative to embark in it; but it seems that this nation which has given the world so many great and important discoveries, was destined to bring its own discovery of the extraction of the sugar from the beet to perfection. This was accomplished by Mr. Schuetzenbach, of the Grand Duchy of Baden. Schuetzenbach re-examined carefully Markgraft's experiments, and found that the first experiment of this great chemist, made eighty-nine years ago, is the best method, when modified, to produce, with less labor and expense, eight pounds of white refined sugar out of 100 pounds of the raw beet-root. This improvement it is, which will, in a short space of time, exclude all the colonial sugar from the European market, as well as our own. This improvement, also, will change the condition of millions of men in the colonies.

The opinion and judgment of a nation, jealous of every discovery or improvement made in other countries, and especially in this branch of industry, in which it has sacrificed millions of francs for its perfection, will serve as a proof of the importance of the new improvement. These new discoveries are detailed in an article which appeared in the *Journal des Debats Politiques et Literaries*, in Paris, dated the 16th July, 1838; by Michel Chevalier, viz:

"It would seem that the spirit which was manifested in the days of the revolution, has been transferred from the political arena, and is exerting itself in that of industry. At this time, the manufacture of sugar from beets is on the point of undergoing a metamorphosis which, as it appears, will change all the condition of its existence, and extend its influence, not only to the consumption, but also to the production of that article.

"Until now, a series of operations has been applied to the extracting of sugar from the beet, which, though simple enough in appearance, are in reality complicated and delicate; which demand not only a great number of intelligent and skilful workman, but also require considerable material to be operated upon; and which, again, consume costly articles, such as milk, blood, animal charcoal, &c.

"In the former process the sugar-beet was scraped; the pulp pressed by means of an hydraulic press. The juice so obtained, underwent defecation, or the separation of the albuminous and mucilaginous elements, and then the clarification and evaporation. Once concentrated, the sirup underwent crystallization, which furnished the raw sugar; and this then had to be refined before it could be admitted on our tables.

"Since its origin, the process of extracting the sugar has always been the main point, but it has been modified and improved in the details; so much so, that our manufacturers, who were ruining themselves when the sugar was at six francs the pound, are becoming rich at the low price of 20 sous per lb. At this time, the scraping, pressing, defecation, clarifying, and evaporating were attended with difficulties, which it required a great length of time to subdue. The loss in manufacturing was enormous, as only from three to five parts of sugar were obtained from a hundred pounds of beets, instead of ten pounds, which are contained in the root.

"With the assistence of chemical analysis, it was ascertained that this evil proceeded from the presence of a certain quantity of acid, of divers coloring, mucilaginous, and gelatinous matters, suspended in the juice. The presence of these mischievous substances injures the sugar, prevents it from crystallizing, sometimes destroys it, and causes it to yield only poor molasses. To prevent these injurious effects, different agents have been used, which were found more or less efficacious. Apparatus was constructed, which accelerated the manufacture, and diminished the time during which the sugar is in contact with these injurious substances; but the inquiry was never made whether it were possible to separate the sugar from those foreign bodies, or at least to neutralize or paralyze their destructive power, before the juice is extracted.

"The new process, first alluded to, was discovered in the grand duchy of Baden, by Mr. Schuetzenbach, of Carlsruhe. The experiments introduced a method of manufacturing the sugar, which was adopted by several manufacturers on the right bank of the Rine, and which is already in vigorous operation.

"Like all ideas which are destined to accomplish revolutions in manufactures, as well as in politics, that which serves as the basis to the new process is simple. The operation of drying the beets immediately after they are taken from the field, is now the first step in the process. By this operation, the mucilaginous matter, which is an integral part of the beet, losses the property of dissolving in water; this drying stops also the fermentation which takes place during the preservation of the beets in cellars or in the heap, and likewise prevents the formation of acids, which were created at the expense of the sugar, and which embarrassed the manufacture of beet-sugar.

"When the beets are once dried, the sugar is easily obtained by mixing them with a small quantity of water, which produces a solution of sugar and a very small proportion of other bodies, and which, by the process of evaporation, gives at once a good product, which can be easily refined.

"In a word, the elementary operation of the desiccation acts with the power of exorcism; it drives from the juice all injurious substances which were the former causes of evil in this manufacture.

"This fact being once understood, and duly verified by experiments on a large scale, it was then important to bring it to perfection by an easy practical manipulation. This is what the '*Societe d' Encouragement*' is about to undertake, and that with every chance of complete success. This is already much more than mere expectation, because the problems which it has proposed are already more than half solved, and the entire solution of them is scarcely a matter of doubt: so that the manufacture of the sugar from beets is about to be built on a new basis.

"The '*Societe d' Encouragement*' have offered the following prizes for the promotion of this manufacture:

"1. One of 4000 francs for the best process for the desiccation of the beets.

"2. One of 4,000 francs for the best treatment of the dried beet for the extraction of the raw sugar.

"3. One of 4,000 francs for the conversion of the raw into refined sugar, without taking it out of the mould.

"4. One of 3,000 francs for an analysis of the beet root, &c.

"5. One of 3,000 francs for the invention of a saccharometer, which should be constructed so as to be easily applied, and to have the property of showing immediately the quantity of crystallizable sugar contained in the fluid under trial. A contrivance of this kind, which would be a sure guide for the farmer, and for the workmen in manufactories, indicating to the former the proper time to collect his crop of beets, and to the latter, how to manage his operations, would be of immense value.

When these five prizes are gained, the theoretical and practical renovation of the manufacture of beet-sugar will be radically accomplished in all its forms.

"To the question, *will* this be effected? it may be safely answered that existing facts scarcely allow of the expression of a doubt that such will be the case.

"The problem of the complete and rapid desiccation by an economical process has presented very formidable difficulties. *This drying may be denominated the* CORNER STONE *of the new system;* but this problem is far from being insolvable; on the contrary, it ought to be regarded as solved.

"In one of the last sessions of the *Societie d' Encouragement*, Mr. Beyrand, of Marseilles, presented beets cut in slices, which were dried in eight minutes by the combined action of pressure and heat, effected by two cylinders, heated to one hundred degrees by steam. This result will appear more prodigious when we consider that 100 parts of beets contain 84 parts of water.

"The beets, prepared after Mr. Beyrand's method, preserve all their sweetness. Mr. Schuetzenbach, of Baden, dries the beets by a slow process, probably less perfect than Mr. Beyrand's method; but the result is already excellent, and favors the application on a large scale. In the manufacture of Mr. Schuetzenbach, the beets are cut in small thin slices, and as soon as they come in contact with the air, they bend and roll up, and lose the property of sticking together, which gives the hot air of a kiln, (to which they are brought immediately after they are cut,) a free circulation in all directions round them. The temperature of these kilns is from 30 to 40 degrees Reaumur, (from 99.5 to 122 degrees Fahrenheat.)

"Mr. Schuetzenbach's apparatus of desiccation is very economical. The machine for cutting the beets costs only from 400 to 500 francs, and half a horse power is sufficient to put it in operation. Such a machine, when at work every day for three months will cut one million killogrammes of beets, (about 1000 tons,) which would be a sufficient supply for a large manufactory. A kiln, about 10 feet by 9, and 9 feet high, dries, in 24 hours, 3000 pounds of beets, and consumes only 420 pounds of charcoal. Three such kilns would be sufficient to dry all the beets cut by one machine during twelve hours.

"In the manufactory of Mr. Schuetzenbach, the dry beets are reduced to a coarse powder, sprinkled over with lime, and stored away in casks. When the sugar is to be extracted, this coarse powder is mixed with water, which produces a liquor marking 21 degrees on the saccharometer; and when evaporated with Roth's apparatus, this liquor yields, without any other preparation at the first chrystallization, a raw sugar, known in commerce by the name of *bonne quatrieme*, which, after a second chrystallization, becomes a *bonne commune*. The advantage of this new method is such, that the beets raised at Esslingen, in Germany, in 1837, (less rich in sugar than the preceding year,) yielded more than eight per cent. of chrystallyzable sugar, instead of five, which was the highest product by the old process; and, in the proportion as the gain on sugar increases, the expenses decrease; so much so, that eight pounds, now obtained, costs less than formerly four or five from 100 pounds of beets.

"Two important points are then attained: *first*, how to dry the beet; and *second*, how to extract the sugar from it.

"To refine the raw sugar, without taking it out from the moulds in which the syrup was placed to crystallize, and which always causes the loss of a considerable quantity of sugar, appears to be a question equally advanced. Recent experiments, on a large scale, show that raw sugar washed in moulds, with pressure, gives, in the short space of three days, a perfect refined article, which formerly required from two to three weeks to effect.

"In regard to the analysis of the beet in its divers states of maturity, nothing has yet been attempted; but this is a task which chemists can at any time accomplish, and the prize held out for it will induce many a chemist to undertake it; and it will not be long before we knew to what extent the constituent parts of the sugar-beet develop themselves simultaneously, and which is the most favorable moment for collecting them for the manufacture of sugar.

"In regard to an exact saccharometer, of a simple and practical construction, with the aid of which all manufacturers can accertain, to a fiftieth part, the richness of the saccharine matter in beets, and of all other substances containing crystallizable sugar, the learned researches of a young chemist, M. Peligot, promise great success. Lime and barytes, have the property to combine with crystallizable sugar, and form together an insoluble composition, in which, nevertheless, the sugar does not alter, and is easily separated from it. In bringing this fact to a simple mechanical operation, no doubt is left that the quantity of sugar contained in beet sirup can be ascertained with the greatest nicety.

"The proplems proposed by the *Societe d' Encouragement* are at this time almost solved. It does not any longer propose to discover a new method, but only to perfect the processes which are already verified by an application on a large scale. Among the advantages which are derived from the renovation of the manufacture of the beet-sugar, is the extension of the culture of the beet-root; because it will be easy for every farmer to send his dry product to any market, far or near, as the weight of the raw beet is reduced, by the process of desiccation, to less than one-sixth part. The beet can now be raised any where, however distant from the manufactory; and, reciprocally, it is possible to establish manufactories in all parts of France, to concentrate them in such places where fuel is plenty and at a low price; whereas, at present, the manufacture is only possible close to a field, fertile enough to produce beets. Another important fact: 1,000 pounds of beets contain 100 pounds of sugar. The price of beets is about 12 francs; the expense of drying and extracting the sugar would not exceed 10 francs, (this is sufficiently proved by experiments;) making the total amount 22 francs. Suppose that one-tenth of the sugar is lost, the manufacturer would have 90 pounds of sugar for 22 francs, or 100 pounds for less than 25 francs. Allowing for small expenses, &c., 50 per cent., the sugar (the refined sugar of this country) could be delivered to the consumer for 38 centimes, (or 7½ cts.) per pound.

"This will create a revolution in the consumption of sugar, as well as in the division of the brances of industry, over the whole globe; then instead of importing sugar from the southern regions it will be left for us to furnish them.

"Michel Chevalier."

Another proof of the practicability and great advantage of this improvement, is the enthusiasm with which it was adopted and put into operation by the Germans themselves, who are generally very careful and prudent in all their speculations. They have already established extensive manufactories on the *Rhine*.

The importance of Mr. Schuetzenbach's discovery is best proved by chemical analysis and examination of the physiology of plants. This analysis of the beet-root shows that 100 parts of the root contain—

86.3 parts of water,
3.2 parts fibrous matter,
10.0 parts of crystalizable sugar,
0.5 parts of mucilage.

By the new process, the water in the beet is evaporated, and there remain only 13.7 parts of dry substance, which consists of the sugar, mucilage, and fibrous matter.

The sugar dissolves in cold or warm water almost instantaneously.

The mucilage is insoluble in water; when in a dry state, and mixed with water, it only swells to a slimy matter.

The fibrous matter is insoluble, and has neither in the old nor new process any injurious influence.

From this analysis, we learn that the mucilage is the only substance which causes all the difficulties of the extraction of sugar. The principal process consists, then, in the separation of the mucilage from the sugar. But is this mixture a work of nature, or the result of the manipulations? Or, does the cellular tissue, of which the beet-root is formed, contain the sugar in its pure state, separated from the mucilage?

These are questions as to the physiology of the beet, which were first suggested by Raspail, a French chemist, (in his work on the physiology of plants, Paris, 1837,) and he solved these important problems by the following microscopic experiments.

"When a thin slice of the red beet-root is brought under the focus of a microscope, it will be observed that the texture of the beet is formed of hexagonal cells, transparent, and of a purple color; these cells are crossed by white ones, four or five times longer than the purple cells; this tissue of white cells is crossed again by bundles of opaque cylinders, of a gray color, through which the spirals (*elements generateurs*) are observed.

"When a drop of acid (*acide sulphurique albumineux*, which has the property of coloring saccharine substances purple) is put on this thin slice, the colors change; the part which was purple turns yellowish, the long cells remain white, but the obaque cylinders become purple."

From this it follows that the cells, naturally purple, enclose the coloring matter and the mucilage, and the opaque cylinders the sugar in its pure state. Thus the mucilage in the beet-root is separated by nature from the sugar, and mixed during the manipulation, which caused all the difficulties of the extraction in the old process, when the mucilage was combined with the sugar in grating, pressing, and even in defecation.

To separate this five-tenths parts of mucilage which the beet contains, occasioned not only the loss of considerable sugar, but also labor, fuel, and costly material, as, for instance, animal charcoal, blood, &c.

The new process acts entirely in conformity with the results of scientific investigation, and the whole process is reduced to a simple operation, which gives a sure gain of eight per cent. of white refined sugar from one hundred pounds of the raw beet-root.

The beets are now cut in thin slices, dried before any fermentation can take place, ground to fine powder, so that all cells are broken apart, and mixed with water, which dissolves the sugar before the mucilage begins to swell. The pure uncolored liquor obtained is evaporated, and the sirup brought into moulds to crystallize.

These statements should be considered as a sufficient proof of the infallibility and practicability of the new improvement; and the introduction and general adoption of it in this country would be of the highest importance to the welfare of its population.

Some enterprising citizens of the United States sent agents to France to investigate the manipulations of this branch of industry; but the results have yet effected very little, and the sugar produced from the beet in this country is of no great account, which arises probably from the want of skilful and intelligent operators in the former complicated manipulations. But, at present, in Europe, the manipulations are reduced to a process much *simpler than brewing common table beer*, which can be comprehended and performed by every person. The period is not distant, when farmers will produce their own sugar, or at least raise and dry the beet ready for the manufacturer.

The general argument against the introduction of this branch of industry, that labor is too high in the United States, is incorrect, when we consider the other great advantages which the United States have over every other country on the globe in almost every business, and especially in this branch of industry:

1st. The United States possess a climate which suits the beets better than any climate of Europe, because the summers are excessively warm, which increases the saccharine property of the beet-root.

2d. Plenty of cheap and rich land, subject to but a small tax.

3d. Inexhaustible stores of fuel, from which the great natural water-courses, rail-roads, and canals branch, over the whole union.

4th. Well-constructed labor-saving machines of all descriptions.

5th. An intelligent population, which, when once acquainted with this branch of industry, will soon bring it to great perfection—a population understanding the use and management of machinery, and famous for improvements and inventions. Whereas, in Europe, the land is over-taxed, high in price, and therefore the interest upon it considerable; subject to *tithes* and other feudal burdens, while the fuel is scarce and valuable, and its transportation high and slow. The population are entirely unacquainted with labor-saving machines, and possess very little mechanical ingenuity, while their enterprise is prohibited by the excise laws of their petty governments.

It is obvious that America overbalances with its advantages, the low prices of labor in Europe; and that she is able, not only to provide herself with all the sugar wanted for home consumption, but also to supply other countries.

The sugar now produced in Louisiana, averages only about four and a half pounds per head for the population of the United States, or about 70,000,000 pounds annually, which is but a small part of our consumption, as enormous sums are yearly paid to foreign countries for sugar, as the following table shows, viz:

1832,	imported into the U.	States,	$2,933,688
1833,	do.	do.	4,752,343
1834,	do.	do.	5,537,829
1835,	do.	do.	6,806,184
1836,	do.	do.	12,514,551

This sum will annually increase in proportion as the population augments and their comforts and means improve.

By the adoption of this new branch of industry, the sums at present paid for imported sugar, would be in a short time a clear gain to the country: its agriculture would be improved, and thousands of acres of exhausted and deteriorated land would be again taken up and improved. To procure the necessary manure for this purpose, the farmer would be obliged to increase his live-stock, which would find, during the winter season, plenty of food in the residuum of the manufacture. It would increase the consumption of sugar among the less wealthy class, and would make their condition of life more comfortable, and, of consequence, greatly extend the population of the country.

The manufacture of sugar is not confined to the beet and cane only. In Hungary, there are at present, manufactories which make *sugar from pumpkins*. The following article, translated from the '*Hanoverian Communicator*,' 1837, gives the particulars, as follows:

"A manufacturer in Hungary, for three years past, has used pumpkins for the manufacture of sugar. We have seen raw and refined sugar, also sirup from this manufactory, and found the refined sugar equal to the colonial in every respect. The raw sugar is crystalline, coarse-grained, light-colored, and of more agreeable (melon-like) flavor than the common raw beet-sugar; the sirup is of a blackish-green color, and has also a melon-like flavor, but is suitable for consumption. The juice, obtained by pressure, yields, on an average, six per cent. of sugar. But the water-melon of the south of Hungary is still more productive than the pumpkin of the north. The sugar obtained from the pumpkin is always considerable, whether the fruit has been raised on rich or poor land. The manipulation is said to be more simple than the manufactory of beet-sugar, and requires less attention, as the pulp and the juice may stand for three weeks without getting sour or losing any quantity of sugar. The juice, during the process of evaporation, does not rise in the boilers, and is not so liable to be burnt. The residuum is very good food for cattle. One acre produces 650 cwt. of pumpkins; twenty pumpkins yield sufficient seed for one acre of ground. From the remaining seed a very good table oil of about 16 per cent. can be obtained.

"MARQUARDT."

Indian corn, at the period of tasselling, yields just half as much sugar as the sugar-cane; and it is astonishing that this well known fact did not induce persons to plant corn especially for that purpose.

To make use of green corn and pumpkins profitably, and to improve the crop of beet in quality and quantity, the following plan is, therefore suggested, which would keep a manufactory in operation all the year round:

We know that the beet requires a deep soil, sufficiently provided with decomposed manure, as when planted in green manure they yield much less sugar, and the operation is rendered more difficult; to prepare the field properly for the beet, it should be well manured, (no matter in what state the manure may be applied,) ploughed, and planted in corn and pumpkins, and worked regularly as long as the pumkins leave room for the horse-hoe. When the corn begins to form the tassel, it should be cut off, and the sugar extracted from it. The pumpkin has then all the influence of the sun to come to full maturity, and should be used, when ripe, for sugar. The following year the field would be in first-rate order for the beet, and the following rotation of crops, viz:

Indian-corn and pumpkins, with manure, } for sugar,
Beets, }
Barley,
Clover,
Wheat.

An acre of good cultivated land yields, on an average, twenty tons of the beet-root. Beets were sold this fall, near Boston, for $5 per ton.

One ton of beets yields, when treated after the new method, 180 lbs. of *white refined sugar*. The cost of manufacturing a ton of beets into sugar would be, at very high estimate, $6. One hundred and eighty pounds of refined beet-sugar would cost $11, or 6 $\frac{1}{18}$ cents per pound, for which we now pay, at the lowest rate, 16 cents.

Mr. Norbert Rilliex, of New Orleans, has recently invented an apparatus for reducing saccharine liquids, which has been patented in the United States, and is already tested.

This apparatus surpasses Howard's and Roth's, or any other invention of this description, not only in simplicity and cheapness, but also in the arrangement in the boiling of sugar, according with the laws of science and economy.

The liquor is reduced by two vertical cylinders, heated by steam, over which the syrup is distributed in small quantities. One of the cylinders operates under a vacuum, and entirely evaporates the condensed liquor by a low degree of heat, to hinder the formation of molasses—an improvement of the highest importance, which, till now, has never been accomplished. The syrup can be reduced to any degree of the saccharometer desired, which is performed by the most ingenious and simple contrivance of a differential thermometer. This apparatus will greatly facilitate the manufacture of sugar, in regard to the economy of labor, fuel, and time, and the perfection of the product. This apparatus will rank among the most ingenious and important inventions.

The production of indigenous sugar in France was one of the main pillars of *Napoleon's continental system;* and the successful extraction of sugar from the beet was relied on as the surest guaranty of its stability.

That branch of productive industry, therefore, which the first statesman and captain of the age, regarded alike as the means of conquest, and the source of wealth and independence, cannot be considered a matter of indifference to the government of this great and growing republic, whose duty and privilege it is to watch over the interest and welfare of its citizens—a goverment aspiring to no conquest, yet whose enviable distinction it is to be regarded as the *last hope of freedom*—the last asylum of liberty.

The information imparted in the preceding pages, collected as it is from the most authentic sources, it is hoped will be regarded as of the highest importance to any and every government, charged with the duty of promoting the great interests of a nation.

Having traced the history and progress of the manufacture of the beet-sugar, from its first discovery in Europe to the present time, through all its varied experiments and decreasing expenses, until no longer requiring the bounty of government, but yielding a revenue, the only remaining inquiry is, how shall the American people avail themselves of the important advantages of this new source of national wealth and industry?

To acquire a correct and minute knowledge of this new branch of industry, (now practically unknown in this country,) it is necessary to visit Hungary, Germany, France, and England, in order to examine all the recent and important discoveries and improvements relating to the manufacture of beet-sugar. To accomplish this object, it would require the following qualifications:

1. A thorough knowledge of the old method of extracting sugar from the beet, and every apparatus hitherto used.

2. A thorough knowledge of agriculture, in order to ascertain the precise cost of the production of the raw material, the influence which it has on the different systems of agriculture, and the economy in regard to the feeding of cattle, &c.

3. A knowledge of chemistry and physics.

4. A knowledge of the languages of the different countries to be visited, and a thorough acquaintance with technical and vulgar terms in mechanics and agriculture, as well as the *patois* of the countries.

5. A knowledge of mechanics and the art of drawing, in order to be able to delineate any apparatus at first sight, and at a glance, as manufacturers are not always willing to have their apparatus examined minutely.

CHARLES LEWIS FLEISCHMANN,
Graduate of the Royal Agricultural Institute of Bavaria.

PATENT OFFICE,
Washington, December 27, 1838.

Patent Office,
December 28, 1838.

Sir—At the request of the author of the accompanying memorial, I have the honor to submit the same to your care, for such disposition as you shall deem best calculated to promote the wishes of Mr. Fleischmann, and the interests of the country.

Allow me to state that Mr. Fleischmann is a gentleman of varied practical and scientific information, and has been for the last two years a resident of this city, and employed by me in the Patent Office. He is a native of Bavaria, and was educated is the royal agricultural and polytechnical school at Schleissheim, near Munich, at which he graduated with distinguished honor, and was appointed *Inspector of the Public Domain*—an office of great responsibility, and rarely conferred but on men of advanced age; he was also director of the estates of Count Seinsheim, comprising twenty-four villages. Emigrating to this country with much experimental knowledge, and well versed in the French and German languages, he has, at my suggestion, draughted this memorial, which I believe cannot fail to be read with deep interest, comprising as it does, the most important and latest discoveries in the manufacture of beet-sugar, drawn from publications recently received at this office from Europe.

Should the government desire the services of an agent to investigate this subject by visiting the manufactories of Europe, I would respectfully recommend the author of this memorial.

With the highest respect,
I remain your obedient servant,
HENRY L. ELLSWORTH.

HON. MR. LINN, *U. S. Senate.*

From the Edinburgh Philosophical Journal.

DISCOVERY OF EARTH IN LARGE QUANTITY FORMED OF THE REMAINS OF ANIMALCULES.

On the 8th January, 1838, Professor Hausmann communicated to the Royal Society of Sciences of Gottingen, a preliminary notice, on a discovery connected with our own country, which is undoubtedly among the most remarkable facts lately added to the science of geognosy.

In the month of November, this year, Colonel Von Hammerstein, president of the Provincial Agricultural Society of Uelzen, in the territory of Luneberg, the able author of several prize essays, and the zealous promoter of the agriculture of his native country, had the goodness to send to Professor Haussmann, two specimens of varieties of earth, which were dug out near Oberohe, during an excavation made by the above mentioned society, in the district of Ebstorf. The extreme lightness of these varieties of earth rendered it improbable that they were of an argillaceous nature; but their state of aggregation did not permit us to conclude that they consisted of pure silica, although, notwithstanding this, they really have such a composition, according to the chemical examination, kindly instituted by Dr. Wigners, in the accademical laboratory. The specimen No. 1, according to this investigation, is chemically *pure silica*. It has, at the same time, a fine, extremely loose, earthy, flaky consistence, and a chalk-white color. It has a soft and meager feeling, somewhat like starch, and does not grate between the teeth. On water it swims for a moment, then sinks down, and gradually swells up. Mixed with a little water, it acquires a pasty consistence, without being adhesive. The specimen No. 2, is also silica, but contains likewise a very insignificant quantity of a matter destructible by fire. Its fracture is fine-earthy; the color brownish-grey, slightly inclining to green, becoming darker by the addition of moisture. It is friable, meager, but soft to the touch, and adheres to the tongue. It swims on water for some minutes, but it afterwards sinks, absorbing water with a noise, giving out many air-bubbles, and then expands gradually by irregular splitting of the liminæ, without being altogether separated. When exposed to heat, it rapidly assumed a white color. Here and there it is traversed by veins of pure, chalk-white, fine-earthy silica, filled with smaller or larger cavities.

According to the information communicated by Col. Von Hammerstein to Professor Hausmann, this silica has been found in astonishing quantity in six different places of the above mentioned district, on the edge and first acclivity of the great plateau of the *Luneberger Haide*, covered to the depth of only one foot and a half by the soil. The pure white silica forms the upper bed, and has a thickness of 10 feet to 18 feet. The colored portion is beneath, and has been already penetrated to a depth of 10 feet, without the lower boundary having been reached.

The peculiar state of aggregation of this silica, led Professor Hausmann to conjecture that it might be analogous to the *Kieselgurh*, found in the turf at Franzensbad in Bohemia, and that like that substance, it might be composed of the siliceous shields of infusory animals. A preliminary microscopic examination seemed to confirm this notion. In order to attain certainty on this subject, Professor Hausmann sent specimens to the distinguished investigator of the infusory world, Professor Ehrenberg of Berlin, who, by his extraordinary discoveries, regarding the occurrence of fossil infusoria, has opened an entirely new field of the most interesting investigations. He requested that naturalist to examine these specimens of earth more minutely, with a special view to these objects, and he received, through his kindness, the intelligence, that *both earths are entirely composed of beautiful and perfectly preserved infusory coverings;* that these are very various, but still belong only to known species, and to such as are found in a living state in fresh water at the present day. In the earth No. 1, they are free from foreign mixture; but in No. 2, they are mixed with organic slime, and with the pollen of pines. During even his first examination, Professor Ehrenberg succeeded in determining several species of infusora, whose coverings form this silica, and in ascertaining that there occurs, in the lower bed, a species of infusoria found in the polishing slate of Habichtswald and Hungary; and another peculiar to the *Kieselguhr* of Bohemia; both of which seem to be entirely wanting in the upper bed: but upon these points we shall defer further remarks, in order that we may not anticipate the publication of the completed investigation of Professor Ehrenberg.

That a mass more than twenty feet in thickness should consist almost entirely of the coverings of animals which are invisible to the naked eye, and which can only be recognized with the assistance of a high magnifying power, is an extraordinary fact, and one which the mind cannot fully comprehend without some difficulty. The farther we attempt to pursue the subject, the more we are astonished. That which occurs in an invisible condition in the fluid element, and which cannot be recognized by the human senses, without the assistance of art, becomes, by immense accumulation and solidification, one of the circle of phenomena, which are witnessed by us in the ordinary way; a compact mass is formed, which can be weighed, felt, and seen; and this mass is presented to us in such quantity, that, when regarded only in *one* direction, it surpasses by three times the height of the human figure. Who could venture to calculate the number of infusory animals, which would be required to produce even one cubic inch of this mass? And, who could venture to determine the number of centuries, during which the accumulation of a bed of twenty feet in thickness was taking place? And yet, this mass is only the product of yesterday, compared with the other more compact siliceous masses for which the infusoria of a destroyed creation afforded materials. But what would have become of that loose, light silica—which, by its great porosity, and its power of absorbing water in quantity, in some measure indicates its origin—if, instead of being covered by soil one foot and a half in thickness, it had been covered by a great mass of earth or rock; or, if another power, such as the action of fire, had caused its solidification? In that case, we should have had no bed twenty feet in thickness, but should perhaps have found a compact stony mass, capable of scratching glass, affording sparks with steel, and polishable,—a substance, which, were it not for the abundant evidence furnished by the discoveries of Ehrenberg, it would be still more difficult to suppose had resulted from the coverings of invisible animals. Such a consolidation and hardening of this loose silica, might perhaps be partly accomplished in another way, by making the experiment of employing it for the manufacture of glass, or as one of the ingredients in porcelain; by which means a discovery so very remarkable, in a natural historical point of view, might at the same time become of practical importance. *Glass formed from the coverings of infusory animals!* Who would, a few years ago, have believed in the possibility of this substance, by whose assistance invisible life in water is revealed to us, being prepared from a material, derived from the same world of extremely minute animated beings; or that we should be enabled, by means of a substance furnished by an invisible creature, to investigate the smallest and most obscure, as well as the largest and most remote, bodies in creation?

[Communicated to us by Professor Hausmann, from the "*Gottingische gelehrte anzeigen*," 25th January, 1838.]—Ed. Philos. Jour.

An additional interest is given to the foregoing statement, by the fact, that a deposite of these infusorial coverings, analogous to that above described, has been discovered by Professor J. W. Bailey, of West Point, N. Y.; and they doubtless will be found in no inconsiderable extent in other parts of this country. Professor Bailey says the deposite he discovered is "8 or 10 inches thick and probably several hundred yards in extent, which is wholly made up of the siliceous shells of the bacillaria, &c., in a fossil state;" v. his paper with figured descriptions in Silliman's Journal, October, 1838. We have examined a portion of this "clay-colored mass," from West Point, under the microscope, and witnessed the organic forms as described by the discoverer. G.

Jour. Franklin Institute.

From the Mining Journal.

SUGAR FROM THE PUMPKIN.

A complete revolution is expected to take place in the manufacture of native sugar—a revolution which will probably compel the beet-root growers to "hide their diminished heads." In other words, the pumpkin is about to enter the field as a rival of the beet-root, and to force the Chamber of Deputies to revise its late enactment on the sugar question. We hear that an industrious speculator is on the point of establishing a manufactory for extracting sugar from this over-grown and hitherto despised production of the vegetable world, the first experiments on which, it is added, have been crowned with complete success.

A CHEAP AND CONVENIENT MODE OF BORING FOR MARL.

To the Editor of the Farmers' Register.

I inclose $5 for Vol. 7, of your very useful Register, and along with them, a lame account of (what I think,) a most excellent implement for boring for marl, or for searching into Mother Earth after many of her hidden treasures; and of which, if there was any merit in so simple a contrivance, I should say I was the inventor.

It consists of a ⅝ inch square bar of iron* of any required length, with a 1¼ inch barrel-auger welded to one end, and a handle of iron, having a mortise to fit the rod very loosely, so that it can slide up and down at pleasure; and a thumb-screw at the side of the mortise in the handle, to fix it at any required height. In forging out the rod, the smith should make with his punch, indentations about a foot apart along the whole length, to receive the end of the screw. So much for the borer. If more than 10 feet be required for the length of the borer, it will be necessary to support the upper end, otherwise it will waver in boring, and prevent the rod from going down perpendicularly. Now to comprehend my fixture, you have only to imagine a large over-grown four-legged stool, over-topping the operater's head about a foot or so, with a hole in the center of the seat through which the rod passes. The legs to be stout and far apart, and going quite loosely through the holes in the seat, with good shoulders for it to rest on. Two of the legs on one side to be fully two feet longer from the shoulders up than the others, so that on the side of a hill, you can preserve the level by lowering the long legs and driving a nail under the seat into each leg, and thereby forming a shoulder. If 20 feet of rod be required, (which is the length of the auger I have in use,) you must put another four-legged stool of light materials and smaller dimensions, about six feet high, upon the top of the first, securing firmly (by mortise) its legs at top and bottom. From the centre of the upper stool, a tube, (made of four strips of thin plank, tacked together,) descends to the seat of the lower stool, and is mortised into it, through which tube the rod passes up and down, and is always kept in place. If more than 20 feet be required, you have only to continue this tube up as high as necessary, and brace it to the seat of the upper stool. The operator has but to turn the handle and he is surprised at the rapidity with which the rod descends, owing to its weight; and he should not bore more than two feet at a time before withdrawing, always relaxing the thumb-screw, and letting the handle fall to the ground before pulling up the rod. The great improvement here suggested, consists in the *moveable handle* upon a continuous rod of any reasonable length, thereby dispensing with screw-joints and other contrivances, which are costly to make, and troublesome in their use. The fixtures to keep the rod plumb, may be varied according to size and great lengths required; but for 30 feet, you will find the above not a bad contrivance.

If you think so poor an affair deserves a place in your Register, you can dispose of it that way; but if not, I shall be nothing daunted, and may *bore* you again another time.

Yours, Nous Verrons.

ANALYSES OF SUNDRY SPECIMENS OF CALCAREOUS ROCK, OR MARL, IN S. CAROLINA.

To the Editor of the Farmers' Register.

Bristol, Pa., Jan. 28, 1839.

In giving you a number of localities, where the earthy or other loose aggregated carbonates of lime are to be found to the south, I omitted to give the analysis of many of them; and as this subject, through your writings, is now becoming of importance, they may be acceptable to some of the readers of your Register.

I observe that my good old friend, Dr. Cooper, is pleased to censure my use of the term "marl"—which is all right. In using it, I did but comply with the common idea, that marl is any earthy material whatever, which imparts or give fertility to soil, being used in contradistinction to manures, which are vegetable or animal, or mixtures of both and also to salt, gypsum, &c., which may be considered in the light of *stimuli*, intended to increase life, as they do galvanic action in our piles and batteries. When a student in France, and as a lecturer, I adopted the French idea of marl, which was this, that any rock, or earthy substance, which by exposure to the air lost its cohesion, and crumbled into earth, which may be subdivided into calcareous and argillaceous, as either clay or lime predominated.

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* I find this rod large enough.

Among the important and interesting deposites of earthy lime-stone to the south, is Shell Bluff, on the Savannah river, about twenty five miles below Augusta. This bluff rises fifty or more feet above the river, consisting of alternations of carbonates of lime of various degrees of impurity, with beds of clay and of sand. The upper bed is about six feet thick, containing abundance of the gigantic ostrea, which were collected and burnt for lime.

The first bed below the oysters we shall call No. 2, this consists of carbonate of lime, 77.6
And fine parts ferruginous clay, 22.4—100.

The next below, each being in the descending order, No. 3, of carbonate lime, 60.
Fine quartz sand and a little whitish clay, 40. —100.

No, 4.	83.2	carb. lime, and	16.8	of coarse quartz sand, and very tenaceous yellow clay.
5.	93.4	" "	7.6	yellowish argil, no sand.
6.	64.4	" "	35.6	white glassy quartz sand, with whitish clay in small quantity.
7.	54.4	" "	45.6	yellowish glassy quartz sand, being stained with iron.
8.	85.2	" "	14.8	glassy sand and yellowish earth.
9.	47.2	" "	52.8	glassy sand and yellowish clay and ochre.
10.	37.2	" "	62.8	light olive colored clay, fine and coarse.
11.	73.2	" "	26.8	coarse glassy sand, with a little yellowish clay.
12.	62.4	" "	37.6	coarse glassy sand, with a little yellowish clay.
13.	73.2	" "	26.8	sand and clay, the former coarse, the latter in small quantity.
14.	47.2	" "	52.8	sand and clay.
15.	71.6	" "	28.4	light yellow clay, very adhesive.

The earthy lime-stone on Mr. Darby's plantation, in Saint Matthew's Parish, S. C., of which I then noticed two kinds, gave by analysis, the first, 92.2 carbonate of lime, and 5.8 clay and iron, the former not very tenaceous or adhesive, the second, 90.4 carbonate lime, 9.6 clay.

The same kind, but at some distance in Orangeburg district, belonging to Dr. Jameson, presented by analysis, 91.6 carbonate of lime, and 8.4 clay, dark colored and plastic; the color was owing to animal matter in great part. This earthy lime-stone was quarried and burnt for lime.

The object in all these analysis was the quantity of lime; the other information, at the time, being of no manner of use, nor will be, excepting for speculative geology, and at a remote day.

LARDNER VANUXEM.

SUGGESTIONS FOR EXTENDING THE USE OF LIME AS MANURE IN VIRGINIA. THE COAL TRADE.

To the Editor of the Farmers' Register.

The ability with which the subject of using lime is treated by the various practical farmers, who contribute to your valuable periodical, precludes the idea that I should be able to say any thing in its favor, which would induce those who do not use it now, in future to commence; but I do not despair of giving such information that if followed, will furnish lime to upper Virginia, at least on much better terms than formerly, and increase the amount with those who now use it. Until our stores of lime-stone in the upper regions of the state are unlocked, we must look abroad for the present and future supply, as heretofore; and it is to the reduction of rates from this quarter only, that my plan is to operate upon. The usual or minimum price of lime, per cask, is about $1 75, sometimes it reaches $2 50, and expenses to be added, which deters many from its use, while if at $1 per cask, the same or more money might be laid out, and double results might be expected.

Lime is usually brought out as ballast; and the reason is obvious, for a vessel coming to Richmond, can always find a load of coal for some port, and thus, if only half freight for lime can certainly be obtained, it would come most freely.

Plan.—Let each farmer calculate how many tierces he intends consuming, and write to some one who is not too much burdened with business to attend to it, enclosing the money to buy, say 50 casks, when it can be bought at $1 to $1⅛. We will suppose 1000 persons to join, and the order will reach 50,000 casks. Each to have a portion sent to him from every cargo. Let it once be understood that the farmer's price would be certain to be $1 for every cask brought here, and, my word for it, we should be well and constantly supplied; the advantage would be, that the storage and all second-hand charges would be thus avoided; for the summer, when little is doing in freights, would be the time to carry up and receive the lime. Our rail-roads have most liberally put down the rates of every improver of the soil to the bare cost of carriage; and I do not hesitate to advance the opinion, that when our packet line of boats to Lynchburg, (the capital of which is $20,000, and mostly taken) gets fully into operation, arrangements of the same kind will be cheerfully entered into; for every cask of lime thus carried, would add at least four or more casks or barrels of produce to be returned in the same boats at a future period.

While I have pen in hand, suffer me to digress from the service of lime, so far as to make a remark upon the value of our coal trade to the state.

Owners and shippers of produce in New Orleans, very frequently ask the captains, or in other words, give them the choice of New York, Philadelphia, Baltimore or Richmond; and in many, *very* many cases, the latter is chosen for the reason, that much of the carriage is done by Egg-harbor and other northern vessels, and going south, they take out their various "notions," and wishing to go home, prefer Richmond; for here they can always get a home freight of coal, and in any other port, they most probably would have to go in ballast. It is to this cause, mainly, that Richmond can now compete successfully with those cities, in sugar, molasses, bacon, lard, &c. and give the purchasers their supplies as they want them; requiring thereby, less capital to do the same business with, than if bought at the north, in anticipation of the trading seasons.

J. H. D. Lownes.

Richmond, Feb. 8, 1839.

PREPARATIONS FOR SILK-CULTURE NEAR GEORGETOWN.

To the Editor of the Farmers' Register.

Georgetown, 1*st Feb.*, 1839.

I shall have, if my roots and cuttings succeed as well this year as the last, from 300,000 to 500-000 Chinese mulberry trees next fall, from six to eight feet high, and abundantly supplied with branches, as I shall give them room enough. I am now building a laboratory for the worms to do their work in, 50 feet by 20, 2 stories. This for a beginning, to feed one million of worms next summer. I shall enlarge it next year to the extent required to feed all the leaves I can grow. I have taken measures to procure silk-worm's eggs from France, which I expect to arrive about the 1st April. I have ordered them of the best description, and shall probably have some pounds to dispose of. Your obedient servant,

J. Mason, Jr.

For the Farmers' Register.

FAILURE OF EXPERIMENTS. MODES OF KEEPING SWEET POTATOES.

It is as useful to the agricultural reader, to learn the failure of any experiment, produced by the suggestions of reported success, as it is to hear of its having fully performed all that was ascribed to it. I am induced to make this observation, in consequence of seeing it stated, some short time back, in the *Register, that if twigs* from an apple tree be inserted in an Irish potato, and placed in the ground, that the twig would grow and flourish, and become a living tree. A friend of mine performed this experiment. He carefully, as directed, inserted a number of fine twigs in an equal number of Irish potatoes, and watered them, whenever it was necessary. But, lo! the twigs all died, whilst the potatoes grew and flourished.*

I have met with another failure in a highly recommended species of corn, the "Baden or twin-corn." I have cultivated this corn for 2 or 3 years, being induced to do so from the many panegyries bestowed on it; but I am led to the conclusion that it will not answer, except on very rich land, and in such land any species will produce well. The objection I have to the Baden corn, is, that it sends out a great number of shoots, or as our farmers term it, "over-shoots itself," and consequently, not one of them attains perfection and makes a good ear, unless the land be uncommonly good; and even then, not over two ears fill out, whilst the remainder amount to little or nothing.

A correspondent in the Register desired to know how sweet potatoes can be kept through the winter months. This is a secret, I can assure him, well worth knowing. I can inform him of the method adopted in the lower section of Virginia, most famous too for its sweet potatoes. This winter, many persons have already lost their potatoes, in consequence of having heavy rains about the time they were dug, which, by being saturated with water, brought on the rot after they were put up.

There are two methods used for putting away sweet potatoes. One plan is to build a small house of brick, sunk one or two feet in the ground. The size of the house to be in proportion to the wants of the farmer; they are generally 7 or 8 feet square, with a small door opening to the south, and a brick left out in the north end, to be stopped or opened as it may be necessary to give them air. When the potatoes are put into this house, some clean dry pine leaves are put over them, as well as under them.

The other plan, which is much the most common, is to put them up in hills out of doors, as follows. A bed of pine-leaves is laid down on the ground about a foot deep, the potatoes are then placed upon it in a pile of a conical form; a covering of dry pine leaves is then put all over them a foot thick, and then dry earth thrown over the whole about 6 or 8 inches thick and carefully patted down with a spade. Some leave an aperture at top, and insert an oblong box, 4 inches square, down to the potatoes, and lay a piece of plank over the outer orifice, which is to be removed in warm days to admit air, as it is considered that much heat is injurious. If these hills be not made with much care, the frost will reach the potatoes and destroy them. To prevent this, I have, for several years, put up my potatoes in such a hill as I have described, made in my cellar instead of the open air; and so far have never failed to keep them, as it is impossible for them to freeze. A heavy rain has lately fallen, and some water got into my cellar, and I fear it may injure them.

Peter De Quir.

For the Farmers' Register.

MARL. MARL INDICATOR. PROLIFIC CORN. SUCKERS. SEED. DEEP CULTURE THE SECOND TIME, PARTICULARLY IN DRY SEASONS. NINE-LOT SYSTEM.

While I make a remittance to the editor, I will also take occasion to offer a few ideas to the readers of the Register. I think it highly probable, that they will not be considered very valuable; and many will think that they had as well not have been published. But this opinion should be resisted in this, *our day* of small things, with due fortitude. It is a sort of "besetting sin" of the eastern Virginian, (and of the southerners generally,) that if he cannot exhibit, or do that which is "first rate," he will do nothing. And while the Register is waiting for its contents to be made up of all the necessary exhibitions of *perfection* in the art and science of agriculture, its editor is put to his "wit's end," in writing, copying and extracting, for the edification and pleasure of its numerous readers, all expecting him to form, for their hungry appetites, a feast of full variety. And why will they not help? Because they cannot surpass every body else; because some more ignorant reader, or less willing contributor, may happen to say, "this is not new, I knew it long ago." While then we aim at perfection, let us remember that the end is to be attained by gradual improvement. Let us not be ashamed of small things, great ones were never yet possessed without them. By the use of twenty-six letters, which were at first only *sounded*, without vanity, pride or shame, the most extraordinary developments of the human mind have been accomplished. Let us do likewise. We should all have cause to rejoice to see the Register filled monthly with what we have *seen, heard and done;* particularly in our own state, and more especially in the eastern part of it, for we need most. But as to what *I* have done, seen or heard.

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* Our correspondent might have seen in the same No., by our comments on the piece referred to, that it was not selected for republication, for its supposed truth, but to expose its worthlessness.—Ed. F. Reg.

I did not commence the use of marl on the place where I live at this time, until 1837. Its effects, consequently, have been observed but on the two succeeding crops; they are good. I think that I may with confidence assert, that I have seen as much as one hundred per cent. produced in the product of poor land. All, however, are not yet convinced of the value of marl. Becoming zeal on the part of its users will sooner or later bring it into general use. I think it probable that many are prevented from using it on account of the burden imposed by the example of those who are applying or have applied it. They are unwilling to begin so heavy a job, as it would be to put from three to five hundred bushels of marl to the acre. I find that no difference in crops can be discovered from like land that has been marled at small and heavy rates. Some ten years ago, I marled a small farm with very strong marl, at the rates of seventy, and six hundred bushels. The result was, that the last was injured, while the first was equal to marling, at any rate, between those extremes. I now consider, that marl, which contains from sixty to seventy-five per cent. of lime, should seldom be applied in a quantity greater than one hundred and twenty bushels to the acre. When the land will bring now five barrels to the acre, one-fifty may be used. The marl I use is from what is called the lower deposite. Some beds are highly calcareous, while others have but a small per cent.; and one kind into which I have dug, has no lime. This appears to be of a dark "bottle-green" color, and is what we call about here, "green sand," though much finer, and considerably different in appearance from the Pamunky "green sand" marl. I am not yet able to report on the effects of this deposite. Over my strongest marl, I often find an over-layer of what is called "blue-fuller." I think it what the English call "fat marl." I was, at first, at a loss what to do with it, but found, on trial, that it was highly serviceable when applied with the shelly part. It appeared to increase the corn-crop nearly fifty per cent. above the simply marled land. That mass of blue was once shells, I think, which were dissolved by the acids of our hills. Some minute shells are still undissolved in it; it abounds most, under oozing hill-sides.

Besides the blue mass, I have tried the swamp over-layer, or mud. Its effects are also very good with the marl. I tried this on some four or five acres alone, last year; but the season was too dry to enable me to judge of it; it must wait for another crop.

I think that I have perceived a manifest difference between the dry beds of marl, and the marl of the lower deposite, in their operation on the *natural* grasses. Both kinds will expel the *poverty* grass; but the higher kind will greatly lessen the crab and fox-tail grasses, both valuable; while the lower deposite seems to promote the growth of both of these. I am sustained in this observation by others, and men of experience. It may result from the application of too much marl, perhaps added to rather too deep ploughing. Close grazing also helps, no doubt. But I have thought that the lower marl contains a salt, not possessed by the higher, which acts as manure, not only to the grasses, but to the crops. This salt can be observed to cover every lump of marl which has been exposed for a while to the atmosphere, as an efflorescent white coat. In an analysis rudely made by me, I lost about 24 per cent., which appeared to have gone off in the solution. I am pretty certain, that this salt, is not "green sand." I sent a sample of marl to Professor Rogers, requesting him to analyze with reference to it, but he evidently overlooked it.

A word as to the "marl indicator." In a back number of the Register, some curiosity was expressed in reference to its discovery. It seemed to be thought highly important. It was suggested, as well as I recollect, that it had been credited to Dr. Westmore, which the doctor declined. I should be glad to know who indeed first noticed the connexion between this plant and the existence of marl. In reference to the matter, I will state, that I distinctly noticed the fact, and constantly, for many years, urged the importance of it upon the public, from the year 1823, when I first commenced the use of marl. I had never heard of it before my observation of it. Finding that it never failed to indicate the presence of marl, or lime, in some form, I considered it highly valuable. While I entertain the hope, that many will yet be benefited by the discovery, I make these remarks merely to ascertain whether any other person had noticed the fact before me.

I am trying the *prolific corn.* The seed were obtained of James M. Garnett, Esq. The first seed were planted in a corner of a field, and of course, received a cross of a large white kind of corn, which grew partly round the corner. I did not like the first crop very well, but concluded, notwithstanding, to extend the crossed-seed to half my crop in 1837, in comparison with a very fine large white corn of the neighborhood. The test lands, particularly, two acre-lots near the house, were not precisely equal, but nearly so. The prolific lot was too thick, (a great mistake as to that corn, it requiring, from acclimation, more distance than is usually given,) and consequently it fired considerably, but yielded eight barrels, one bushel and a half to the acre; while the other gave a product of only twenty-nine bushels. The two lots were immediately contiguous, so as to cross again. From this second crop, being convinced that the *prolific* suited me, notwithstanding the fault-finding of many who had tried it, I took my seed exclusively. My last year's crop was of that kind. I find that weak land, such as mine, in general is, cannot produce a very large corn; and if it be made able to bring the largest to perfection, it will certainly give a fair return of the smaller varieties. Many of those who have fallen out with the *prolific* corn, are at fault themselves; expecting an unreasonable return, and planting too thickly. But the prolific delights exceedingly in something *stimulating* and *nutritious*. It is weaker in draught than the large corn, which is proved by the fact, that if they are planted in alternate rows, the large corn will beat it readily. Good authority, in my neighborhood, asserts, that a better crop of wheat follows it, than will follow the larger corn, which sustains my observation. I think that the prolific corn will recover its reputation after a while, unless we can find a better. I shall plant a few acres of the genuine Baden corn this season, received from Thomas H. Baden himself.

I have tried the "*corn-sucker*" question too, and would in reference to the matter say, that to insure in this climate, a good return of sucker-corn, we should have a very rich soil, which must be deeply ploughed; the seed should be planted at something like double distance, the crop thoroughly cultivated, and have an unusual supply of rain throughout July and August. Without these prerequisites, *much hope*, but *little corn* will our fields produce. I should call this a *humbug*. I think it, and am satisfied. With the two parent stalks, I had sometimes as many as nine stalks, from seven to ten feet high, standing at about five by three feet distance. But lacking the great prerequisites, and finding that both parents and children would *perish*, in the midst of the season, I thrust in the knife, cut off the suckers, and so, succeeded in earing the stalks only tolerably. Theory and fact will sometimes disagree.

Of seed-corn. I commenced a trial of the comparative value of seed from the top, and from the under ears of the most prolific stalks. The season was so dry last year, however, that it left me in great uncertainty. I felt glad to find even one on a stalk. Thousands had none. The observation made by me, however, led me to prefer the top ear. Whether it *is* more productive or not, time may yet prove. *It is generally* larger, and is probably more perfectly matured, *if* we understand the philosophy and physiology of the corn-plant.

Of the corn-culture. What I have now to offer, is neither my own nor new, but it seems to me to be very valuable. An excellent manager in King William, Mr. John Luckhard, has probably for many years practised it, besides many who have received it from him. Not to go into the minutiæ of the culture, I wish to state, that the most successful plan, (circumstances considered,) consists in "*siding*" the corn, [turning off the earth from the stalk,] with four furrows, which is generally done in stiff land—the last two being very superficial. The hoes now clear the plants of grass by a cross-wise stroke, so as to remove it from the top of the bed; this is followed by the usual course, of what is called throwing dirt to the corn. And then comes the plan proposed. Instead of the introduction of the cultivator now, the *plough* is continued, running the first furrow near the corn, but *very superficially;* the next is to be deeper and so on, until the whole space is thoroughly broken. The corn, during this last ploughing is large, too large, many think, to bear such treatment. But this appears to be the only successful course for a *dry* season. It will succeed well in a wet season also, but its peculiar value is owing to its effects in the absence of rain. Those who advocate the level system of culture will object to the probably high beds, which will result from twice throwing dirt to the corn; but we again appeal to experience, to *fact*. Many cases, of the most striking character, can be adduced in this quarter in proof of the correctness of the practice. Thorough-cultivation seems to be all-important in a *drought*, while it is admitted that the superficial plans will answer well in ordinary seasons.

Lastly of the nine-lot system. The opinion of the editor, is respectfully requested as to the propriety of the plan. For the improvement of an exhausted farm, I have divided it into a standing pasture, and nine other parts for cultivation, viz: two parts to be in cultivation every other year in corn, to be followed by wheat. These contain between forty and sixty acres each, are marled, or nearly so, and are to receive all the manure that can be raised—dry leaves, soil from the woods, and swamp-mud, excepted, which will be put on other lots also; so that the rotation and treatment are, manure, corn, wheat. Then come three lots, to be cultivated in corn, wheat and oats, clover, with help from the woods, swamp and marl. These will contain only about twelve acres each. The balance of the arable land will make four lots, to be improved by marl, &c., and cultivated in corn, wheat, &c., and clover. Under this system, I work one of each of the lots annually. I think the four-field system possessed of some advantages over this, but it also, has its objectionable points. My greatest difficulties are to be found, I fear, (for I only commenced it last year,) in support for my stock in summer, and the uncertainty of getting clover to "stick" or take on poor land. Without marl, there would be no hope of it. It is my opinion, which is based on last year's trial, that such land can be restored by repeated pea-fallows, green, sooner, and at a smaller expense, than it can be done by clover. I obtained a fine fallow of peas after wheat, last year. The editor will please give me his opinion, or advice as to these matters.

J. DU VAL.

King & Queen county, Feb. 2d, 1839.

From the London Horticultural Journal.

ARTIFICIAL MANURE.

The Horticultural and Agricultural Societies of Paris have lately been directing their attention to the value of the receipt left by M. Jauffret, for making artificial manure. It was at the request of the minister of agriculture, that the Royal and Central Society of the Seine undertook the examination of this question: and M. Quenard having, about the same time, laid before the society two modes of fabricating manure, different from M. Jauffret's plan, it was determined to compare the respective plans together, and determine on their relative utility. M. Quenard is secretary of the Agricultural Society of Montargis, and is esteemed as an experienced cultivator. One of his manures is a species of compost, and the other is analogous in principle to the preparation of M. Jauffret. As this subject is considered of great importance in France, we have thought fit to lay before our readers a concise account of M. Quenard's method of proceeding, premising that the commissioners appointed by the Royal Society of Paris have not yet given in their report.

The mode of preparing the compost is simple enough:

1st. A layer of green stuff taken from a pond.
2d. A layer of quick-lime, ashes, and soot.
3d. A layer of straw and green grass.
4th. A layer of quick-lime, ashes, and soot.

These layers are repeated until they reach a cart load at least. Holes are then made through the several layers, and a quantity of water is introduced, sufficient to saturate the mass, and cause a thorough mixture of the vegetable matters with the alkaline and sooty substances. According to M. Quenard, this produces a perfect compost. The second preparation differs from the other, inasmuch as the dissolution of the alkaline substances are first obtained by means of a prepared lye, which is used to saturate the matters which are to be transformed into manure. The following are the proportions to be used in turning 1500 lbs. of straw into manure. In a vessel, possessing greater breadth than depth, pour in—

1st. 800 pints of common water.

2d. 125 pints of oven-ashes, if they can be procured, as they have the property of potash to some extent; if not, you must use the common ashes.

3d. 75 pints of soot, if possible, from kitchen chimneys, for this soot contains more of animal matter, and is more soluble in water. This mixture must then be well stirred up, and made to incorporate.

4th. 20 pints of powerful lime, which must be first slacked with the usual quantity of water.

The whole of this must now be well stirred together again so as to insure a perfect amalgamation of the several matters. From time to time, during twenty-four hours, this mixing must be renewed, and at the end of that time, the dissolution of the whole will be effected. This liquid will be found exceedingly powerful, and capable of producing fermentation. Plunge into this liquid, while moved quickly about, in order to hold suspended the insoluble particles which usually settle at the bottom, the quantity of vegetable substances, which it is desirable to turn into manure—no matter whether they are dry or green, easy to be dissolved or refractory, in with them. When they shall have been well saturated with the liquid, place them in a trench, prepared beforehand, with a channel through the side, to let the superfluous moisture run off. This you can receive in vessels, as it will be of use again. As many layers of the stuff thus perfectly wetted may be placed as may be required. Care must be taken to stir the liquid well, each time that new vegetable substances are put in. As each layer is put on the heap, it should be well beaten down. The more the whole mass is united together, the quicker will be the result. At the farthest, the delay never exceeds 16 or 18 days, according to the temperature of the place. The heat may be increased, and the fermentation quickened, by surrounding the heap with whatever substances may be lying about. At the end of three or four days, the heap is wetted with the liquid, from time to time, up to the sixteenth or eighteenth day, when the manure is found ready for use. It is important to preserve a certain quantity of the first preparation, to mix with the mass afterwards, to promote fermentation. Time and quality will both be gained in this manner. This part of the liquid, thus preserved, may be considered, for manure-making, what mother is in vinegar, yeast in beer, or baum for baking. M. Quenard declares, that he has for years tried this preparation, and that it never, by any chance, has been found to fail. We place it before our readers, leaving them to try the experiment on a small scale.

From the Journal of the American Silk Society.

EXTRACTS FROM THE PROCEEDINGS OF THE SILK CONVENTION.

ON THE FITNESS OF THE UNITED STATES FOR SILK-CULTURE.

Mr. G. B. Smith, of Baltimore, said, with the consent of the convention, he would offer a few remarks in support of the resolution now under consideration. That silk may be grown in all the United States, not only for domestic purposes, but as a valuable article of commercial export, he knew from his own experience, and from the testimony of the most respectable people in every state in the union. I have now, said Mr. S. been twelve years engaged, more or less intimately in this business. For seven years, I kept an experimental cocoonery, for the express purpose of obtaining and diffusing information on the subject; and during the whole of that time not a single instance of its failure had been made known to him, which could in the remotest degree be attributable to either climate or soil. On the contrary, he had been able to prove, conclusively, that the climate of our whole country was better adapted to the silk-culture than that of any other county, except China; and ours suffered nothing in comparison even with that. The great desideratum in a climate suitable for the most successful production of silk, said Mr. S. is *dryness;* and the more marked the climate of the country in this respect, the better is it adapted to the silk-culture; and the further it is from it, the less is it fit for the business. If gentlemen would take the trouble to examine the writings of the Chinese, as translated into French and thence into English, and embracing a period of upwards of four thousand years, I believe, they would find that a dry atmosphere has always been considered essential to the silk-business. He had found it necessary in this place, to employ stoves to expel dampness. He considered England nearly equal to France as to temperature, but the atmosphere is too damp for the successful culture of silk. Even in Ireland, where the climate is much more salubrious than that of England, and the temperature unobjectionable, the culture of silk cannot be pursued. He had been surprised to see a publication made in the north of the successful use of even wet leaves—leaves even dipped in water. It had been stated, that worms fed with leaves thus wet, had made better silk, and more of it too, than when dry leaves were used. He begged to caution this convention against the practice. It might succeed in a single experiment, when all other circumstances combined in its favour; but as a regular practice, it was highly dangerous. He had twice lost his whole brood of worms from feeding with leaves only slightly wet with dew. On the contrary, he would make a fire in his cocoonery in even damp weather, no matter how warm the weather might be, and especially at the time the worms were beginning to spin their cocoons. At this period, a dry atmosphere is absolutely essential to the formation of good silk. In damp weather, the cocoons will be soft and flabby, the fibre cannot dry speedily as it is spun by the worm, and the consequence will be an inferior article.

That silk may be cultivated in *any* part of the U. States, is proved by the fact that we want but six weeks of warm weather for the purpose; and what part of our happy country is there, asked Mr. S., in which we have not six weeks of hot summer weather?

Mr. Smith pointed to a morus multicaulis tree, standing at the extremity of the hall, four or five years old, and grown in the state of Connecticut, unprotected from the inclemency of the winters, and yet it was uninjured; and alluded to another which had remained uninjured upon the brow of a hill at Hyde Park, on the North river, state of New York, for five or six years. [It has indeed been there since the spring of 1830, as it was given to Dr. Hosack, by Dr. Pascalis, at that time,] and yet it remained perfect, not a bud had ever been killed. Mr. S. said he knew that silk could be made from the morus multicaulis in almost every section of the Union, and as we were but just entering upon this important branch of industry, which he hoped yet to be able to call American industry, it was of the utmost importance that we begin right. We have no prejudices to contend with, no old orchards of other trees to get clear of, no bad habits to eradicate, as in Europe.

We are asked why they do not make silk from morus multicaulis in Europe. The reason is obvious. They must in the first place go to a very considerable expense in the purchase of the trees, as we have to do; but in addition to this, they have their old over-grown white mulberry trees to dig up and throw away. Besides this, in Europe, generally, the landlords own the trees and sell the leaves by weight to the surrounding peasants to feed the worms with; and so long as they can sell their white mulberry leaves, they will not be very likely to destroy the trees for the purpose of replanting their grounds with the multicaulis, and especially so as they will not derive much if any advantage from it. Another reason why they do not make silk from this tree in Europe, is, the trees are all in possession of the nurserymen, who propagate them for exportation, for which they have a demand at high prices. The probability is, that at this day, there is not one hundredth part as many plants in France as in the United States. But neither in France nor in the United States, will any one make silk while they can sell the trees at the prices now current in both countries.

Mr. S. related a series of experiments in feeding from fifteen varieties of mulberry, in 1830, viz: the morus multicaulis, the Tartarian, the white mulberry, (several kinds,) common wild mulberry, &c. &c. the result of which, fully convinced him of the superiority of the morus multicaulis. The worms preferred it, the cocoons were larger, and the silk better and stronger. He then tested the strength of the silk from different varieties of the mulberry, by suspending weights to each till it broke, and in every instance, he had found that from the multicaulis to bear more weight than any other kind. The native mulberry produced silk next in strength to that from the multicaulis, and the Tartarian next. But the difference was extremely slight. He believed it did not amount to more than three or four per cent. between the strongest and the weakest.

Mr. S. asserted that the multicaulis was not a Chinese tree. There was in the Phillippine Islands, it was true, a tradition that a colony of Chinese who emigrated to those islands, had brought the tree with them secretly from China; but various orders had been sent to China for it, but the tree had never been found there. The white mulberry, said Mr. S. is a native of China, and not of Italy as is generally supposed. We had no doubt taken the idea of its Italian nativity from the fact of its extensive use in that country. The seed derived from China is white mulberry seed, in some of its varieties. And here, said Mr. S. permit me to state a fact in relation to such seed. The white mulberry "*plays*," as the gardeners express it, into more varieties than almost any other tree when raised from seed. I have seen a bed of seedlings all from the same parcel of imported seed, from which might be selected an hundred different varieties. It was a singular fact, that white mulberry seed raised in this country did not thus play; its produce were almost always the same as the parent tree.

Mr. S. spoke favourably of the Alpine mulberry and of the Brussa, the latter being what he formerly had in his grounds, and used for feeding worms, under the name of the "Constantinopolitana." The word "multicaulis" was adopted by the Linnæan Society of Paris, as being descriptive of the specific character of the tree, which is many-stalked; that is, numerous stocks grow from the crown of the roots, like those of the lilac, hazle, &c. The first introduction of the name multicaulis, into this country, was in the early part of 1830. Three of the trees were sent to the late Dr. Pascalis, of New York, under the name of morus multicaulis, with a detailed description of the tree and its botanical characters. Dr. P. sent the pamphlet containing them to me, and I at once discovered that the descriptions and drawings applied exactly to my Phillippine island mulberry, as we then called it, which had been in my possession for some time, presented to me by my friend Mr. Prince, of Long Island. This tree is still in my possession.

In reply to several questions from different gentlemen, Mr. S. stated, that he had found his worms, fed upon the multicaulis, as healthy as those fed upon other varieties of the mulberry. The soil best adapted to the multicaulis, is a slight sandy loam, or gravelly soil; the situation should be high and dry, with a northern or north-western exposure, and no protection. Indeed he would select the coldest and bleakest hill-side for his multicaulis. When protected by a wall or close fence from the northern blast, they have been frequently killed; but if planted upon a high and dry ground, where water cannot stand about the roots, and exposed to the north, they can hardly be killed. They should not be grown upon low or rich ground; they become too succulent, and grow too late in the fall. Mr. S. said that his tree had always been perfectly naked of leaves and the wood perfectly ripe to the topmost buds, before ice began to form in the fall. He objected to a clay sub-soil, as it would retain too much water, and expose the roots to injury. He related an interesting experiment which he had tried in feeding with fifteen varieties of mulberry leaves; the worms uniformly preferred the multicaulis, or, as it was then called, the Phillippine island mulberry.

From the Journal of the American Silk Society.

STATEMENT OF PRODUCT OF SILK, MADE BY THE REV. WM. MC LEAN, OF NEW JERSEY.

Much doubt having been entertained by our farmers and others, whether the production of silk could be made profitable in this country, the Monmouth County Silk Manufacturing Company, of New Jersey, last spring, offered a premium of eighty dollars to the person who would produce the greatest number of pounds of cocoons from the sixteenth of an acre.

In order in some measure to test the matter of profit, with reference to this premium, and anxious myself to see what could be done the first season, even by the most inexperienced, I measured and planted with the morus multicaulis the sixteenth of an acre.

The ground was laid of in a parallelogram form, about thirty by ninety feet. The soil was not rich and not more than two ordinary loads of manure, worth one dollar each, was put on the lot. I planted roots the growth of the previous season, in an upright form in rows eighteen inches apart, and the trees about ten inches apart in the rows—twenty-three hundred and twenty roots in all. The ground was by no means suitable for trees, being a cold heavy clay, they were accordingly small—not having attained an average of more than three feet the whole season. The roots were planted the twentieth of April. In order to have the full advantage of the growth of the leaves, I intended to feed but a few worms at a time, and have successive crops.

On the nineteenth of June, when my trees were about eighteen inches high, my first eggs hatched, the next hatched June twenty-sixth, sooner than I expected or intended. Fearing I might get no more eggs to hatch, I fed about twelve thousand worms on the sixteenth. The trees being small and the season exceedingly dry, the leaves grew very slow. About a week before the worms spun, I took from the worms I was feeding on the leaves produced on the sixteenth of an acre, about five thousand, and borrowed and weighed the leaves to carry these through. To do this, required one hundred and forty-three pounds of leaves. The worms thus fed, together with a few hundred of the two-crop variety, fed late in the season, produced *thirty-eight pounds and eleven ounces* of *cocoons*. After deducting the proper amount for leaves borrowed, which, according to Count Dondola, is twenty-one pounds of leaves for each pound of cocoons—six pounds and thirteen ounces being deducted, I had from the sixteenth of an acre *thirty-one pounds and fourteen ounces of cocoons*. About nine pounds of these cocoons were the mammoth white, the balance were the common sulphur, except about two pounds of the two-crop variety. I was entirely ignorant of the process of feeding when I commenced, and indeed of the necessary fixtures and accommodations for feeding to advantage. I fed them as much as they would eat, kept the hurdles clean, and the room well ventilated. The weather was exceedingly warm during the whole time of feeding; but the worms were remarkably healthy, and all wound in about thirty to thirty-four days.

Now as the matter of profit, if thirty-one pounds fourteen ounces is produced from the sixteenth of an acre, then *five hundred* and ten pounds is produced from the acre.

From the Journal of the American Silk Society.

ESTIMATE OF THE VALUE OF MULBERRY AND SILK CULTURE, STATED BY DR. WM. GIBBONS OF DELAWARE, IN THE SILK CONVENTION.

In the following estimate of the intrinsic value of the morus multicaulis, in the culture of silk, I present nothing, but what any one, with a little knowledge of the subject may arrive at for himself. The circumstances alone through which it was elicited, gave it a peculiar interest. I had heard it repeated from various quarters, and read it in the papers of the day, that the price given for the morus multicaulis was an absurd extravagance, that the traffic in it was a wild and ruinous speculation, a humbug, &c. From this cause I was induced to sit down soberly at my desk, and descending to the root of the matter, calculate what the tree was worth, *for the production of silk alone*; discarding all speculation on the profits of raising the trees for sale. And in doing this, to bring my opponents to ground that could not be disputed, by taking known and established data for this calculation, to wit:

1. That one tree of the morus multicaulis, with its side branches, costing sixty cents, with allowance for failures, will make at least sixteen trees, by cuttings.

2. That one cutting, in good ground and with good culture, will produce, the first summer after planting, from eight to ten ounces of leaves.

3. That 3,000 good cocoons will produce one pound of silk.

4. That 12,000 cuttings will grow, for one year, on an acre.

5. That three-quarters of an ounce of leaves will feed a worm.

With these data, the following results must be manifest.

1. 750 trees, including the roots, plant an acre of 12,000.

2. 12,000 trees from these cuttings, yield 100,000 ounces of leaves.

3. 100,000 ounces of leaves, will feed 130,000 worms.

4. That an allowance of 10,000 in 130,000 for death of worms, and bad cocoons is a sufficient allowance, and

5. That, therefore 130,000 worms, will yield 120,000 good cocoons, yielding when reeled, forty pounds of raw silk, and

Lastly, that forty pounds of raw silk, well reeled, will bring $200.

The expense may be estimated as follows:

Rent,	$10	
Planting and culture of the trees,	30	
Raising the worms,	30	
Reeling the silk,	20	
		90
Profit per acre,		$110

In those states where a bounty is given, it must be added to the above; and where the trees are left out through the winter, the planting, &c. of the trees and cuttings must be subtracted from the amount of cost.

The sum expended for trees at 60 cents, is $450 ; the net gain, therefore, amounts to twenty per cent. the first year on the capital laid out, and leaves $30 for incidental expenses.

For the second year the cultivator has 192,000 trees and roots, the net profit of which, planted on sixteen acres, will amount to $1760, which will leave him a handsome income, and allow him ten per cent. on the cost of a cocoonery. The profits of the third year, should he plant all his roots and cuttings, will pay him for all his improvements, and leave a large sum of money in his pocket.

Now if these important results, which may be readily obtained, were brought before the American public by being carried out in practice, in different sections of the country, it could not fail, eminently to encourage and extend the silk culture.

From the Journal of the American Silk Society.

ON THE RESOLUTION (WHICH PASSED) RECOMMENDING THE ADOPTION OF THE PIEDMONTESE REEL.

Mr. Smith, of Maryland, remarked that the great object to be attained was uniformity in the quality of American raw silk; and this could only be accomplished by the adoption by our whole country of a standard of reeling. As the subject had been suggested by him in the business committee, he would give his reasons here, why he considered the subject of so much importance; and also, why the Piedmontese reel was the only one on which we can rely for the attainment of the great object.

In the first place, said Mr. S., all principal articles of produce are subject to regulation by certain legal enactments, or by inspection, or both, in all countries. The Piedmontese government required all raw silk to be reeled upon a reel of a particular construction, that the form and quality of the article might be uniform and superior. No sooner was this regulation adopted by the government than an improvement in the value of the article took place ; and to this day, Piedmontese raw silk commands a higher price than that of any other country. In our own country, the article of flour is not only required to be inspected before it can be sold, to insure its conformity to certain standards of quality, but even the laws require that the barrel which contains it shall be of a certain number of inches in length of stave, and so many inches in diameter of head and bilge ; not only these, but the barrel must contain 196 lbs. of flour. And similar regulations exists in relation to almost every other article, certainly all staple articles. Why and for what reason are these regulations adopted? Need I ask this large assembly this question? Is the answer not most obvious to all men who are acquainted with the commerce of the world? The reason is, that the article shall always be of the highest attainable quality, and that it shall be known as such in the commerce of the world ; that it shall establish and maintain a character for itself, which shall give it precedence every where. It is well known that in foreign countries the value of articles is often depreciated by mere character, and the reverse. For instance, in South American ports the price of flour varies more on account of the *brand* than on its intrinsic quality. A vessel load of one particular brand, often sells for two or three dollars a barrel more than that of another brand ; when, if the real quality of the two parcels had alone been looked to, perhaps the prices would have been reversed. The reason of this preference was alone to be found in the previously established quality of the preferred brand ; and it was a fact to be remembered by this assembly, that however good other brands might be, it required a long time to counteract the prejudice in favour of the object of preference. Much, therefore, depends upon character, and it stands us in hand, as beginners in the great business of producing silk, to establish a character for our raw silk at the start, that shall not only insure it equality of consideration in all the markets of the world, but give it precedence every where. And, (excuse me for repeating what I have so recently asserted, when I had the honour to address you on another subject,) all we want to secure this precedence in the very factories of Italy herself, is this uniformity and excellence in reeling. Yes, sir, adopt this resolution, and let the American people imbibe and practise upon its spirit, and you will kill every silk worm in Europe. The Italians themselves, to say nothing of France and England, will give us twenty to thirty per cent. more for our raw silk than they will for any produced in Europe ; because, besides its regular conformity in reeling to their known and accepted standard, its intrinsic quality of fibre is superior to all other silks, owing, as I have before stated, to the peculiar adaptation of our climate to its most perfect production.

In the second place, the reasons why the Piedmontese reel is the only one on which we can rely for the accomplishment of this great object, are these. The Piedmontese reel produces the most perfect article of raw silk of any reel known. For a long period of time the silk-producing countries of Europe, were without any fixed standard of reeling. Almost every filature used reels different from all others. The forms of the article were as various as the number of the reelers. The consequence was, that the manufacturers were obliged to adapt their machinery to every little parcel of raw silk. This caused much trouble and expense to the manufacturers, and they of course were obliged to deduct an equivalent from the price they paid for the raw material. This condition of the silk producing interests at length attracted the attention of the Piedmontese government, which, after long deliberation, appointed a board of scientific men of the highest character, to construct a reel upon such principles as should insure the most perfect article. The result was the reel now known as the Piedmontese reel, and which is universally used in Italy, and which is now recommended to your attention, and for the adoption of the American people. Let me digress again for a moment. I do not pretend that '*Yankee ingenuity*' cannot invent a more ingenious machine; I know them too well for that, nor do I wish to compel all our people to purchase and use this or that man's manufacture or construction—we care not who makes or who sells the reel used. The great object is to induce all our people to use reels that shall produce a uniformity of results; and as the Piedmontese reel produces raw silk of the most perfect quality, as silk from this reel is known and appreciated all over Europe, and all the machinery of the factories are adapted to its use, we ought to adopt this reel also. As we are *beginning*, it will be far easier for us to adopt the Piedmontese reel, and make our raw silk conform to the standard of form now preferred, than to compel all the factories of Europe and America to alter their machinery for the purpose of adapting it to our silk. The Piedmontese reel is constructed upon principles peculiar to itself. The skein produced by it is always exactly of a certain length, (six feet eleven inches circumference,) the threads are laid upon the bars in a diagonal line, crossing obliquely each layer in such a manner that the fresh wet thread never comes in contact with the wet thread just before laid on, and consequently there is no glueing of the threads together. The skeins thus reeled are also unwound by the manufacturers without any waste, as the peculiar manner of laying it upon the reel enables them to unwind it without any difficulty from *tangling*. Various other valuable objects are obtained by the use of this reel, which it would take too much time to describe in detail.

But, continued Mr. S., even if this reel possessed no single quality superior to the hundreds of other kinds, the single fact that the article produced by it is known and preferred throughout Europe and America, is sufficient of itself to warrant us in universally adopting it.

It seems necessary to explain that the object in recommending the Piedmontese reel, is, that we may produce the best possible commercial article of raw silk. We have no reference to the making of sewing silk, or other domestic articles; nor have we any reference to the use of the various machines that have been invented for making sewing silk, &c. These machines are all, doubtless, admirably adapted to such purposes; and will no doubt be used for them. But it seems necessary to say here that raw silk, as reeled on the Piedmontese reel, is adapted to all the forms of manufacture to which raw silk can be applied; and that after it is thus reeled, it can be doubled and twisted into any form required. It is a matter of doubt with me, therefore, whether any of these machines will be retained in use for any kind of silk after we obtain a thorough acquaintance with the subject.

Before I conclude, permit me, in answer to various questions from different parts of the house, to say, that there is in Philadelphia, a perfectly constructed Piedmontese reel. It was imported in 1826, by Dr. James Mease, of that city, who was then actively engaged in promoting the cause; and I believe that reel is the only true one ever imported. Dr. Mease early foresaw the great advantage of *beginning right* in this business, and permit me to say here, that to him is the country indebted for much valuable information on the subject of the silk-culture.

Permit me, Mr. President, to make one more remark, and I will then leave the subject to the disposal of the convention. I have labored hard and long in the silk cause; I have done much to introduce into our beloved country, this most valuable branch of industry; but I have never done any thing of half the importance to the cause that this resolution will accomplish, if seconded by the American people. I feel, Mr. President, that all that has been done, is a mere drop in the bucket compared to this. I therefore ask the convention to pass this resolution, or at least the spirit of it, for I care not for the form, so that we obtain the substance—and I shall then have done my task, I shall have accomplished the great work that has been, I might say, the main object of my life—or at least of twelve years of it. Were I required to point out, as the last act of my life, the way in which my country and countrymen would be most benefited, I should unhesitatingly point to the general production of silk in a domestic way, in all our farmers' families, and in a uniform manner, as the great source of national and individual prosperity, yet reserved to the American people.

DIARY

OF AN EXPERIMENT IN REARING SILK-WORMS.

[There is no mode of conveying agricultural instruction which is so interesting, and at the same time so impressive, as by presenting an accurate and full detail of all the circumstances of some trial or process, with all the incidents, errors, and mishaps, as well as the correct operations and successful results. In general treatises, or in general directions and didactic instruction, the writer necessarily proceeds upon the supposition that each of his rules, as presented in order, is understood, and properly obeyed, and that all goes right in the procedure founded thereon. He cannot, without digressing intolerably, consider and provide for every exception, and disaster, to be caused either by ignorance, or neglect of the directions, or by unavoidable evils of bad weather, or other accidental and rare disasters. It is an account of those necessary omissions, that general treatises, or merely didactic instructions, are rarely satisfactory in all respects to those who are previously altogether unacquainted with the subject, and who, therefore, need to be informed on every particular, many of which would be so familiar to the more experienced writer, as not to be deemed worth being mentioned.

The following diary, (though more concise than is to be desired, on than would have been presented to readers as little informed on the subject as the people of the United States,) is an excellent illustration of what has just been said. The writer is a very intelligent man, and a zealous, though not long experienced silk-culturist; he having had but the benefit of an apprenticeship, or the conducting of a course of experiments, of eleven years in this business; which he had first introduced in a part of France where it had not before been practised, and where it was before thought unsuitable, on account of the comparatively severe climate. For the department of Aveyron, though in the southern part of France, is so elevated as to be as cold as the northern departments, in the latitude of Paris. The general procedure of M. Carrier in feeding silk-worms is evidently directed by Dandolo's rules, which are those laid down in the French treatise of which a translation was made for and presented in the last volume of this work, (commencing at p. 468, vol. vi.;) and reference to the directions there given will serve to fill out, and make clear, every thing which may not be stated here with sufficient fullness and particularity in the diary. In reading the statements of daily operations and condition of his laboratory, we become, as it were, the companions of the writer in his labors, anxieties, and pleasures, and feel interest in, and derive lasting as well as useful admonition from, every occurrence. We enter fully in all the writer's cares and feelings, sympathize with him in his disappointments, and rejoice with him in his success. Such a diary has all the interest of a narrative of novel facts, as well as offering the most effective of instructions. We hope that the plan of communication here presented, will be adopted this summer by some of the many rearers of silk-worms in this country; and that their diaries, made much more full and minute than this, will be given to the public, through the Farmers' Register.

The following is one of several letters written by M. Carrier to Bonafous of Turin, one of the most distinguished investigators and scientific cultivators of this branch of industry, after Count Dandolo. Each of these letters embraces either the statement of the distinct operations of a particular season, or some other separate and substantive subject, which may appear alone, without suffering for the omission of the others. This is the fourth letter; the fifth will be given afterwards; and the sixth (which was obtained first) was translated for and published in the Farmers' Register, (vol. ii. p. 537) and was thence copied into several of the agricultural papers of this country. It presented estimates of the profits of each of the three departments of silk-culture, (viz. cultivating and providing the leaves, feeding worms, and winding the silk,) which would be more interesting and valuable to readers at this time, than when the translation was prepared and first published. To be interested and instructed by an article on any subject, it is necessary that the readers' curiosity and desire to learn, should have been excited; and for want of previous excitement, or sufficient interest felt in advance, it is probable that various articles which we gathered from French journals, and published in the Farmers' Register several years ago, were not then duly appreciated by readers, who would now study them with interest. Under this impression, we shall resort to the same sources, (from which the American public has been excluded, except so far as this journal has served as the channel of supply,) for some other articles which were then passed over, but are well deserving notice now.

There is a mistaken impression upon most well-informed persons in this county, which causes them to under-rate the value of the writings of French silk-culturists. This is, that silk-culture having been very long prosecuted in France, the articles published thereon, in periodicals of the present time, would be only suited for the information of people who are supposed to be already well versed in the regular business; and that they would contain almost nothing for the instruction of novices, and for a country in which the culture was untried. If the premises were true, this conclusion would be undoubtedly correct; for the best instructions on any subjects, furnished by agricultural periodicals, will always be presented by writers who are in very similar circumstances, and not very much advanced as to time and proficiency, before those seeking to be informed. Between those who are the most and the least advanced in knowledge, there is a want of feelings and ideas in common; and when the best informed instructor is addressing well-informed readers, his lessons will be worth not much to the most ignorant. But though silk-culture in France dates from the time of Louis XI, it has been confined to the most favorable portion, and to a very small proportion of the territory, and carried on even there in a very rude manner. It is but recently that exertions have been made to extend the business, and in its highly improved state, to the central, and even to the northern parts of the kingdom; and the facts and reasoning necessary to forward that object, and all the lights thrown on the subject, are therefore precisely suited to those persons who have had little or no experience. Hence, the recent writings of French culturists are of especial value to the many new or intended beginners in this country.—Ed. Far. Reg.]

FOURTH LETTER FROM M. AMANS CARRIER TO M. BONAFOUS, DIRECTOR OF THE ROYAL GARDEN OF TURIN.

Translated from the French, for the Farmers' Register.

Rodez, June 30, 1833.

I resume, sir, with the most lively satisfaction, a correspondence which has been interrupted by political events, during the last three years. Do not believe, however, that this stormy time has slackened my zeal, or suspended my labors in planting mulberry trees, and continuing my annual rearings of silk-worms. In truth, in 1832, fearing the invasion of the cholera, I limited my operations merely to raising as many silk-worms as were necessary to preserve the stock of the two precious varieties which you had sent me from Turin. But the crops of 1830 and 1831, increasing in quality each year, have given fine products, and furnished occasions for making new observations, which have entirely confirmed my hopes. All the intelligent persons of our department (Aveyron,) are now persuaded, by twelve public rearings of silk-worms, made at Rodez during twelve successive years, and which have given, on the average, 103 lbs. of cocoons for each ounce of eggs, that no doubt remains as to the possibility of introducing, generally, in our country, that branch of agricultural industry, which offers the most certain advantages to all those who can, and know how to avail of them. I will state, besides, as additional proof, and which I think will be conclusive, the result of my operations of this year.

Not having forgotten, sir, that I owe the greater part of my success to your kindness, and especially to the excellent instruction which you have frequently addressed to me directly, I am the more desirous to continue to inform you of my trials, and the progress annually made therein.

To render my statement more exact, I shall lay before you an analysis of the journal of my rearings, in which I have been in the habit of carefully noting the operations of each day, as well as all the facts which appeared to me worthy of being examined.

Rearing of silk-worms made in 1833, *from* 22½ *decagrammes of eggs, (*7½ *ounces.)*

May 7th. The eggs detached from the cloths, and collected in the vessels for washing and cleansing them.*

11th. The eggs put upon hurdles of wood, and placed in a small apartment, for the purpose of hastening the hatching by artificial heat, which was at first raised to 75 degrees, then to 77, and at last to 82.†

18th. The worms hatched in great numbers; this had been announced by some few of them hatching the day before. The same day (18th,) the first lifting and removal of worms were made, by the ordinary procedure, amounting to about half the whole product.

19th. Nearly as many more hatched.

20th. A few more obtained. The balance of the eggs appearing unproductive, were thrown away.

At the hatching, the worms were distributed into three divisions, so as to make them come to maturity at one or two days difference of time between the several portions. This plan has always been found convenient, because it facilitates the labors of the last days, by dividing them, and thus requiring fewer laborers and less haste, and permitting more economy. This plan is very easy to put in practice, as the silk-worms accommodate themselves wonderfully to their treatment. Their growth is forwarded or retarded at pleasure, by employing more or less heat, and more or less food, without danger of injuring their health in the least. In resorting to this plan, however, it must not be neglected to keep the worms of each of the different divisions perfectly equal in their condition, in order that the several moultings of each may be made regularly and at one time.

No notice will here be taken of any but the first division. The same cares were given to the two others, and the like results were produced.

First Age.—May 18th. The first day of the rearing, the silk-worms were lifted at 10 o'clock in the morning, by means of young shoots of wild (or seedling) mulberry. In this day they also received two repasts of leaves chopped very small.

19th, 20th, and 21st. They had four repasts, each day.

22d. They seemed disposed to make their first moulting. Still a repast of more or less leaves, was given.

23d. They are almost all in their dormant state. To hasten to that state the more backward ones, a few more leaves were given to them at many times during the day.

24th. No food given. In the morning, some worms already awakened, and the others still torpid. At 4 o'clock in the evening they had revived in great numbers. To-morrow all will be awake.

This first age, which has lasted 7 days, has been very fortunate. Not a single worm has been lost. The temperature of the small laboratory has been kept constantly, by means of fire, at from 66 to 68 degrees.

Second Age.—May 25th. At 4 o'clock in the evening, the worms after having completed their first moulting were lified by twigs of mulberry of somewhat larger size, and changed to a larger apartment. At 10 o'clock at night, they had another repast.

26th, 27th, and 28th. They devoured, with avidity, five meals each day. Their health is perfect. Five meals were given for the purpose of advancing this first division two days before the second.

29th. Again five meals, but less copious. The decrease of appetite indicates the approach of the second moulting.

30th. The worms eat very little, and by evening are all torpid.

31st. They revive, with facility.

The second period has also been passed through most fortunately, and again was of 7 days' duration. The litter has not been changed through this age, because it was not thick, and never moist. The leaves, besides, have been given with discretion, and were always entirely devoured. As yet there are no worms dead, not even of the sick and the backward. The insects have continued so lively and animated, as to cause good hopes of the results. The temperature has continued, without fire, at from 71 to 75 degrees.

When it was determined to hatch more than 7 ounces of eggs, the design was to reduce them afterwards to the product of 5 ounces, by getting rid, at each moulting, of the worms in bad condition and of doubtful health. It was believed that there would be leaves for no more. To-day, after an examination of resources, and of the fine appearance of the mulberry trees, it was decided to throw away none of the worms.

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* The various operations which are here slightly alluded to, are fully described in the treatise on rearing and feeding silk-worms, translated from the French, in the 6th vol. of the Farmers' Register, from page 468 to 480.—Ed. F. R.

† The degrees of temperature in the original are marked according to Reaumur; in this translation, they are changed to the equivalents of Fahrenheit's thermometer.—Ed. F. R.

Third Age.—June 1st. The worms commenced their third age, and were changed to the large laboratory in two hours of time. In this new locality, at noon, the temperature was 73 degrees without fire. This first day, three repasts only were given.

2d. The weather is very fine, and the interior heat was 75 degrees at half after 7 o'clock in the morning. At 4 in the evening a storm occurred which has very much lowered the temperature.

3rd. At 5 o'clock in the morning, the thermometer indicated only 59 degrees. The worms then have experienced, within 24 hours a diminution of 16 degrees. It was observed that they seemed a little benumbed, and that they ate the leaves but slowly. Many fires have been lighted, and notwithstanding, at 5 o'clock in the evening, the thermometer has lowered still 2½ degrees more. Raining all the day. The leaves had been gathered wet, but they had not been given until after being dried upon the floor of a high stage, in a brisk current of air. Notwithstanding all these evils, the worms appeared lively enough at the last meal, at 9 o'clock at night.

4th. At 5, A. M., the outer air was cold, and the thermometer indicated 55 degrees in the laboratory. The fires have been quickened, and the temperature was raised, in two hours, to 62 degrees. The evening was milder. The worms are well, and eat wonderfully.

5th and 6th. The weather fine, and the thermometer at 66 to 68 degrees during the 24 hours. The worms doing as well as is possible.

7th. Rain all the day. The leaves gathered wet, but dried around a fire. The moulting, which ought to have taken place yesterday, is retarded by the humidity of the weather. The worms are becoming torpid but slowly; yet they have had all the day from 66 to 68 degrees of heat, by aid of continual fires.

8th. The weather fine enough, although the sky has been obscured part of the day. Almost no fire, and yet the temperature all day has been from 66 to 68 degrees. The worms seem to be all in their dormant state; still, every two hours a little cut leaves given. It was observed at the time of this moulting, as in the preceding years, that there were a few worms which did not become torpid, and which wandered over the leaves, without eating. Three hundred of these worms have been put, for experiment, upon a little shelf to themselves. Perhaps some curious observations may possibly be made on them.

9th. The weather very fine, and the worms in the best state of health. At 5, P. M. they are almost all awakened. The temperature, without fire, has been constantly from 68 to 71 degrees.

The third age then has lasted nine days, and has been sufficiently remarkable for the inconstancy of the weather, and still more for the variations of temperature of the laboratory. The moulting, however, has been very good, and the worms do not appear to have sustained any other damage than being one or two days retarded in their progress to maturity.

Fourth Age.—June 10th. At 10, A. M., the worms have commenced their fourth age. They have had two meals, without counting in the leaves of the twigs by which they were lifted from the litter. The weather superb. The thermometer has risen in the day to 77 degrees, and has not been under 68, without fires. Never was there a better promise of success.

11th. Wind from the south, very strong. Still 68 to 71 degrees of heat. The worms increase in size visibly, and still go on well.

12th. The thermometer had sunk in the night to 62 degrees. The wind is very cold. The fire in the chimney has been lighted. To-day too many leaves have been given; the worms have not eaten all. Orders are given to clean it away, and to supply food less abundantly.

13th. The worms eat heartily, and are growing fast. The temperature 64 degrees with fire, in the morning; and from noon, 66 to 68 degrees without fire.

14th. Rainy weather all the day. The leaves have been gathered part wet and part dry. There was need of fire to keep the temperature up to 64 degrees.

15th. In the morning 62 degrees, and at noon 66. Weather gloomy. The state of the worms shows that they are about to make their last moulting.

16th. Almost all the worms assumed their dormant state in the course of this day. The warm and clear weather favors their sleep. At 11 at night, a violent storm arose, with loud thunder.

17th. The worms revive, all together. The sky is clear, the air hot and heavy in the laboratory. Notwithstanding the opening of the windows, and of a large ventilator, (*soupirail*,) the heat could not be reduced below 75 degrees. Up to this time there has been no unpleasant scent; persons unaccustomed to the air of a laboratory, have not been able to discover any other odor than that spread by the green leaves of the mulberry.

The fourth age has been finished, and perfectly, in 8 days. The worms entered and revived from their last moulting very equally. At this moulting, there were fewer wandering worms, by half; and these were taken out and thrown away immediately. To this time, the rearing of this year presents much less of loss than in any of the preceding years. The season has been very favorable.

Fifth and last age.—June 18th. All the operations of changing the worms to fresh hurdles have been completed with rapidity, in a fine day and with a natural temperature of 73 degrees. They have seized on the young branches of mulberry with the greatest eagerness.

19th. In the morning, the temperature was at 66 degrees, at noon 71, and at 3 P. M., 75 degrees. The worms have had to-day four meals and have eaten 8 quintals* of leaves.

20th. Cloudy; 71 degrees. The appetite of the worms augments, and the consumption (of all of the three divisions) has risen to 10 quintals. The rearing goes on well.

21st. Weather cold and gloomy. Temperature 62 degrees. The fires have been lighted, and have increased the warmth to 66 degrees.

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* The Paris quintal is 100 lbs.

The worms have had, at four meals, nearly 15 quintals of leaves. No worms dead, nor dying.

22d. The sky is still obscured, and the weather continues cold. At 5 A. M. the thermometer indicated only 62 degrees, notwithstanding the increased fires. None of the worms which have made the fourth moulting have been found dead; and there are some dead of the small number which did not then fall into the fourth sleep. All of this kind are thrown away, without mercy. The consumption of leaves becomes enormous; it has been, this day, about 20 quintals. The worms are in good appetite.

23d. The worms are in the most ravenous state, and could not be doing better. The sun reappears, and the temperature rises, without fire, to 71 degrees. The consumption of leaves is frightful. The trees are stripped, and the fear of the leaves failing causes me much uneasiness. The expenditure to-day is 23 quintals. The windows remained open through the day. Still no bad odor. We have not cleaned the hurdles since the last moulting, but it will be done to-morrow, not so much for the purpose of removing the litter, which is but of little thickness, and not heated, but to give the worms more space, as they lie very thick.

24th., After the morning meal, the worms were removed, and the litter cleared away. There were found on the hurdles very few dead worms. The strongest appetite *(freze,)* continues still, but less violently, especially in the evening. However, 18 quintals of leaves have been devoured. The number of mulberry trees yet to be stripped is greatly diminished, and the fear of a want of leaves increases every hour.

The day has been very fine, and the interior temperature has been kept to 71 and 73 degrees, the windows being open from 10 in the morning to 5 o'clock in the evening.

25th. This, the eighth day of the fifth age, has been very fine. The temperature still 71 to 73 degrees. The appetite of the worms slackens progressively, and the fear of there being want of food is much lessened. There still remain 37 large trees to strip. The consumption 13 quintals. It is already observed, with pleasure, that the worms are disposed to spin. They exhibit all the signs of their maturity being near. They will doubtless climb in two days. We must to-morrow fix the faggots of broom, (or hedge for them to spin in.)

26th. The brightness and heat of the day yesterday have much hastened the maturity of the worms. These circumstances will advance, by a day, the term of their career. There were found many of them this morning which had already quitted their litter, and had climbed even to the ceiling. After the meal at 10 A. M. there is a general movement on all the hurdles; the worms run here and there, searching for support. There can be no mistake; they are ready to mount, and this is especially the moment of delight to the amateur culturist. Four persons are engaged immediately in placing the branches of broom upon the highest shelf, in order that they may receive the most forward worms from all the hurdles below. This operation will not cease until all the shelves are thus prepared. As fast as the broom is placed, the worms climb to it with a degree of haste which I have never before remarked. This labor is finished at 5 in the evening, and nearly half of the worms are already mounted. The weather changed towards noon. The sky was covered with clouds, and at 6 o'clock a storm occurred, accompanied by loud claps of thunder, which operated to slacken the climbing of the worms, but caused not the slightest derangement to the labors of those already on the broom. The consumption of leaves still diminished; and no fear remains of any scarcity.

It should be observed that the quantities of leaves used, and which have been stated for the latter days, were consumed by the whole mass of worms of all the three divisions. With all the desire to do so, it was impossible to estimate separately the quantity eaten by each division; and the statement made, of their joint consumption, is only to establish a fact which should warn all persons, beforehand, of the enormous provision of leaves which must be made for the last age.

27th. On this, the forty-first day, and the last, of the rearing, the worms of the first division are all lodged in the cabins made by the placing of the broom, and they are actively engaged in spinning their cocoons. The other two divisions are following near, to the like successful end.

I leave for a time, sir, my wonderful spinners to their labors, and in a continuation of my letter, which will not be long in coming, I shall present to you the product of this rearing, and the observations which it has caused me to make; and I will speak to you of the progress of the planting of mulberries in our country, leaving the evidence of results to show the advantages which the people of Aveyron can draw from this culture.

AMANS CARRIER.

ESTIMATES

OF THE EXPENSE AND PROFIT OF AN ACTUAL REARING OF SILK-WORMS.

[The following article is not less interesting than the preceding, of which it is a continuation, and for similar reasons. It presents a statement, in detail, of the expense and profits of an actual rearing of a brood of silk-worms—and not merely, like such as has been so often published in this country, an estimate of what the writer either supposes in advance of facts, or wishes his readers to believe, *would be* the cost and profit of operations yet to be performed, and of which the value is yet to be tested. Such a mode of estimate may show any desired result, and therefore they may be had of any desired amount in American publications, and offering from $100 to $1000 of returns from the mulberry leaves of an acre, to be fed to silk-worms. The estimate of M. Carrier may also be very incorrect in the general result shown. But even if so, he has exhibited the facts and stated the prices which furnish his premises; and if the valuations are wrong, the error may be corrected, or made such as the reader may admit as certain, and the product be then calculated according to the change of the grounds of calculation. And though we confide fully in the correctness of M. Carrier's estimates for the country in which his labors were performed, they are necessarily unsuited in several respects to the circumstances of the United States, in general, or Virginia in particular. This detracts nothing from the value of his practice and opinions; but will require to be made by the American reader some allowances in the data, which of course will affect the result. Thus, the prices stated for labor are much too low for this country. Those for white mulberry plants are very low, in money-price, compared to those now given here for the multicaulis mulberry. On the other hand, the loss of the use of the white mulberry, for the first five years of its growth, costs more than thrice the purchase-money; and the rent of land in France is tenfold more costly than that of equal quality in Virginia. But all these differences of circumstances, though they should be duly considered and allowed for, are not in the least objectionable. It is sufficient for our purposes, and profits, if a certain amount of labor, of land, of food, &c., can produce a certain amount of silk at Rodez; for our climate is better for silk-culture, and therefore, the employment of the same means will produce equal, if not still more valuable results.—Ed. F. R.]

FIFTH LETTER FROM M. AMANS CARRIER, TO M. BONAFOUS.

Translated for the Farmers' Register.

Rodez, July 5th, 1833.

I have presented to you, in my letter of the 30th of last month, the principal circumstances of my rearing of silk-worms of this year. I propose now to show you what profits I should already have realized therefrom, if I had been willing to forego that to be derived from the winding of my cocoons.

By July 2d, the worms of all the three divisions [as stated in the preceding letter,] were fixed on the hedge. The backward worms were but very few; and, with some care, cocoons were obtained from almost the whole of the worms.

On the 8th, four persons were employed in gathering the cocoons from the broom which had received the worms of the advanced division. This labor occupied the whole day.

On the 10th and 12th, respectively, the same persons performed the like operation for the two later divisions. There were found on the broom a very few dead worms, of the kind called *capelans* in the south, because of their black color. I shall give hereafter the reason of this rare fact.

On each day of gathering, the cocoons were weighed with minute precision. The weights were as follows:

July 8th, 1st division,	356 lbs.
10th, 2d do	292
12th, 3d do	280
Total,	928 lbs.

The cocoons collected were placed upon the same hurdles which had served for the feeding, (but after having been cleaned and again covered with paper.) They occupied six shelves of 27 feet long, and 4 broad. The thickness of the cocoons was about three inches. It is, as I was told, the best mode of preserving them, by preventing their being heated, which happens when they are heaped. These cocoons have been examined, with the greatest attention, by experienced connoisseurs. It results from this verification, that they are of very equal sizes, almost all depressed around the centre, and well furnished with silk to the extremities, a circumstance very favorable to a good winding; in pressing them between the fingers, there was some difficulty to indent them. Their color is of the whiteness of snow, and their texture extremely fine. Taken at hazard, and on many parts of the hurdles, it was found that it took 208 cocoons to weigh a pound.*

I will observe to you, sir, and I shall do it with pride, that we have already arrived at equalling in products the model-rearings of Count Dandolo. We have obtained 123¼ pounds of cocoons from the ounce of eggs; and, according to the tables which accompanied his excellent work, his crop, in each of these years, barely reached 121 pounds from the ounce of eggs.

I do not pretend to believe that we shall be always equally favored; for I think, and ought therefore to say, that many fortunate circumstances concurred at this time, to cause such success. These were, the fine weather, and the abundance and excellence of the leaves for the one part, and for the other, the favorable position of the new laboratory, the increase of currents of air, a better arrangement of the hurdles, and perhaps, also, the management better understood than formerly.

Elsewhere, however, still better products have been obtained; and it is gratifying to me to inform you of a rearing made in this department, of which the result proves that we are very favorably situated to profit by silk-culture. Madame Loirette, of Millau, has raised this spring the silk-worms proceeding from 5 ounces of eggs; and has obtained 700 pounds of cocoons, or 140 pounds to the ounce. This lady, whose intelligence and zeal are already properly appreciated, has a claim to the gratitude of the country, for the good example she has offered, in making, every year, very careful and well conducted rearings of silk-worms.

I now reach the essential part of my letter, to that which will fix, I doubt not, the attention of my countrymen.

After being satisfied that mulberry trees can prosper in our country, and that the climate is favorable to raising silk-worms, the capital object of the proprietor is to know what expense will be requisite for him to incur, in undertaking this culture, and what are the profits which he may expect to obtain. To fix this properly, it is only necessary to make an estimate. Mine will be here presented.

In 1829, the seventh year of my planting, I showed, (in a note addressed to you, Sept. 15th,) that the clear profit of my rearing silk-worms at that time, had been 33⅓ per cent. upon the capital employed for the purchase and planting of the mulberry trees, the use of manure, rent and tillage of the land. Now I shall make the account for the eleventh year since beginning the plantations.

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* This great weight, as well as the length of all the ages of the worms, prove that they were of a larger kind than the common; and, as we believe, less profitable.—Ed. F. R.

The piece of land where my mulberry trees are planted, is at the gates of Rodez, and devoted, these thirteen years, to the culture, as a nursery, of all kinds of trees, for fruit and ornament, to the number of more than 80,000. The size is about three hectares. The part occupied by the mulberry trees cannot be estimated at more than one-sixth of the whole surface.* For the sake of proper order and arrangement in the plantations, and to regulate things so that the mulberry trees intended to produce leaves for feeding shall not in any manner injure the trees of the nursery,† I have enclosed this property by a road of three metres [10 feet.] in width, planted on both sides, with a row of dwarf mulberries, standing at three feet distance from each other. This road forms straight lines from one corner to another. All the irregular parts lying outside of this great quadrangle [formed by the road,] are also set in mulberry trees. I have also planted upon a point exposed to the south, 125 standard mulberry trees,‡ which are in five lines, and fifteen feet apart. Some other trees, which also are standards, separate the several compartments of the interior of the nursery.

Estimate. Expenses of every kind.

	francs.	c.	francs.	cen.
225 standard mulberry trees at	1		225	
Planting and manuring the 225 trees at	0	75	168	75
450 dwarf-trees on the borders, or separate,		30	135	
135 dwarf-trees disposed in a hedge,		30	40	50
Planting and manuring the 585 dwarfs at		60	333	
2,500 plants in seed-bed, the 1000 at		20	50	
Their planting, without manure,			100	
Culture, 40 days' work a year, and for 11 years, 440, at	1	50	660	
Rent of a half-hectare of ground for 11 years, by the year,	100		1,100	
Total expenses,			2,812	25

Not an inconsiderable part of the plantations which are embraced in this estimate, are of trees of three, four, and five years old; and one-third of the trees, at least, have not been stripped this year, particularly a young coppice of 1500 dwarf-mulberry trees, grafted not long since. I think, after these considerations, that it is just, for fixing the exact income of 1833, to deduct from the above expense, that of the culture and rent of ground occupied by the trees of which the leaves have contributed nothing to the production of the cocoons. In this case, the sum total of 2,812 $\frac{25}{100}$ francs, will be reduced to less than 2000. However, it is this last sum which I have taken as the basis of my operation. If I do not count, in the general addition of expenses, the interest of the sums advanced each year, nor the rent of the locality for the feeding, it is because I have been largely indemnified by the result of the preceding rearings, and by the crops of vegetables of every kind, cultivated between the rows of mulberry trees.

Let us now see the product of the rearing, and compare the revenue of this year with the expenses already incurred.

The 928 lbs. of cocoons, might have been sold, for cash, according to usage, at 1 franc 50 centimes - - - - -			1,392.00
Deduct the expenses of rearing, viz.:			
62 days' work of a man, at	1.50,	93.00	
33 do. of a woman, at	75	24.75	
16 do. of a child, at	50	8.	
4 sacks of charcoal	1.50	6	
Pit-coal - - -		8	
Lights - - -		2	
Loss of broom to form the cabins, and of which the rubbish served to feed the fires - -		20	
Paper and other small charges - -		10	
Total expenses			171.75
Net product			fr.1220.25*

This sum of 1,220 $\frac{25}{100}$ francs, obtained, in the eleventh year of my planting, from the employment of a capital of 2000 francs, is equal to an interest of 60 per cent. And even if the whole expense of 2820 $\frac{25}{100}$ francs be counted as the capital, the interest will still be above 40 per cent.

It should be observed moreover that this plantation gives product in the five years less considerable, in truth, [than will be the average product,] but which will progressively increase with the growth of the trees, without the expenses being increased in the same proportion.

Such results, (obtained at Rodez, a point of the department where the climate is severe enough, and the temperature very variable,) appear to me, as I have said before, of a kind to command the attention of all the proprietors of land proper for this culture. Indeed, I ask of you, sir, what other branch of agricultural industry offers to the cultivators such great profits?

I will add some of the observations which I have been able to make upon my three last rearings of silk-worms.

I. At each period of the life of the worms, there are to be observed some that are not disposed to moult. These are of two kinds; the first are swollen, larger than the ordinary worms; their color is livid and shining; they are almost always extended upon the litter, without making the least movement; however, when food is given, they climb upon it, and eat a little. The others, to the contrary, are meager, thin, and wrinkled in the forward part of the body; they remain attached to the point of the hurdle which they occupy, keeping their heads raised, and moving them continually. Their muzzle is very pointed. These two kinds of worms seem to be suffering under some disease which obstructs their moulting. There perish a number at each time for moulting. Three hundred of these, were separated this year, at the third moulting, and placed apart for observation. It resulted from this trial, that more than half of them could not moult, and were dead in a few days. The large and shining ones died of the *gras*, or *yellows;* and the others became contracted and shortened in a remarkable manner. Their bulk diminished more than half, and they were soon in a state of putrefaction. Among these sick worms which got through the difficulties of this moulting, many sunk under the fourth; and none made any other than bad cocoons. From this fact, which, in my opinion, is at present incontestable, I conclude confidently, that it is best to hatch at least one-fourth more worms than you intend to rear. By this means, you can rid yourself, at the different moultings, of all the backward worms which consume uselessly much of the leaves and cause infinite trouble in attempting to equalize them with those more advanced. For several years, I have been using this method with success. To put it in practice, it only requires at each moulting a day's labor of an experienced hand, who picks them out and throws them away. This little expense is well paid for.

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* The hectare is not quite 2½ English or American acres; therefore the whole piece of land was about 7½ acres, and the part in mulberry trees, 1¼ acres.—Ed. F. R.

† It should be borne in mind, that it is of the white mulberry that M. Carrier speaks; the leaves of which are not plucked for feeding, nor cannot be, with safety to the trees, until after the trees are five years old.—Ed. F. R.

‡ *A haute tige*, that is, intended to grow to full or natural size, instead of being confined and dwarfed by close planting, or other means.—Ed. F. R.

* Or $227.65, the franc being 98 $\frac{3}{16}$ cents.—Ed.

II. It is best to keep an empty hurdle ready for the moment at which the worms are ready to begin to spin their cocoons. This practice has two great advantages. At first, that of allowing the faggots of broom to be fixed at the first sign of the climbing of the worms, and of its being done with care, without the fear of seeing the worms crushed under the unskilful hands of the operators; and of cleaning them more conveniently and thoroughly than when they are upon the shelf on which are formed the cabins: then, these boughs, which ought always to be put on the upper hurdle, are destined to receive the worms from the lower shelves, which anticipate by some hours, or even a whole day, the general climbing. This process also permits you, before placing the broom on the edges of all the hurdles, to wait until the greater portion show a disposition to climb. When this moment comes, they are taken from the shelf next below, and are placed on the highest which has been prepared for this purpose. This hurdle is cleansed, the broom is put on it, and the worms from the next one below are removed to it, and so on, whatever may be the number. In this manner, the lowest hurdle remains vacant, and ought to be furnished with boughs to receive from the upper hurdles the backward worms which do not climb for 24 or 36 hours at the latest. By this process, the worms are not put under the cabins until they are ready to spin; the hedge is then covered with worms in a little time, and as soon as it is perceived that those which remain cannot find a place there, you must hasten to remove them, to prevent their suffering from the filth of those which first climbed up. It is to this method of proceeding, sir, that I attribute the great advantage I have had, this year, of finding very few worms called *capelans*. This fact is easily explained, by the worms which climbed first being healthy and vigorous, while among the backward are found a certain number which have scarcely strength to climb the hedge, where they perish without ability to begin their work.

III. In the twelve rearings I have made, I have not found a single worm dead of *muscardin.* Our climate seems fitted to remove from us the danger of this terrible scourge, which, in warmer climates not unfrequently destroys whole laboratories. I ought to tell you, however, that having been in the habit, for two or three years, of opening all the cocoons intended for propagation, whenever the butterfly failed to come out, I have found from ten to twelve which enclosed a worm in the state of disease called *muscardin*, or *dragée.*

IV. Wishing to examine, myself, if it was possible to retard sufficiently the hatching of the eggs, so as also to retard the rearing, in years when foliage is backward, I made this year the following experiment: On the same day that the eggs were put in the chamber heated to the temperature of 19 degrees, I had a small number placed on a marble table, without any thing intervening but a thin sheet of paper. This table was in a room the doors and windows of which remained open a large part of the day, the temperature varying from 7 to 18 degrees. The eggs so placed, have fully answered the object, and the worms were hatched four days after those which had been warmed artificially. They have been reared seperately, without much care, and have succeeded well. This experiment seems to me to prove two things: first, as I have already often said, that worms hatched spontaneously yield good products; and secondly, that there are very few means to impede, for any length of time, the hatching when the proper season arrives, unless by a procedure extraordinary, and always uncertain; for example, by means of ice-houses. Is it not to be feared that infecundity of the eggs will be produced by exposure in such a place for a long time? It is not the cold exactly, that I would mostly fear, because in the winter of 1829 and 1830, the greater portion of my eggs for propagation were placed in a chamber, where the thermometer descended more than once to 16 degrees below freezing; and another small quantity which was left attached to the borders of the shelves, where the moths had laid them, was exposed to a degree of cold as much as 2 degrees below 0, during the most rigorous days of that memorable winter; and, would you believe it sir! all these eggs hatched well and produced fine looking worms.

I shall have still farther observations to present to you, but think it time to end my present letter. In my next, I will tell you of our perplexities in winding, and our efforts to overcome them. I will also keep you informed of the progress of our mulberry plantations, and you will be convinced, sir, by my communications, that if we have had to struggle for a long time against vexatious prejudices, they are on the eve of disappearing from our department. Private interests, besides, will be the most able advocate for the adoption of a culture which produces so much for my country.

AMANS CARRIER.

For the purpose of making the statement complete, for the benefit of readers who have not the 2nd volume of the Farmers' Register, an extract will be taken from M. Carrier's sixth letter, which was therein given at length.

1. "The proprietor who wishes to occupy a plantation of mulberry trees, supposing he had already at his disposal a quantity equal to those which I stripped last spring and in the same condition, (that is) producing 160 quintals of leaves at 4 fr. the quintal—well! this proprietor could have obtained from half a hectare of ground with no other expense than that of cultivating the trees, a revenue of 640 fr. or. 320 fr. for each *seteree*. composed of 640 square fathoms.

2. The person who would have bought this quantity of leaves to devote himself only to the raising of silk-worms, would have had (as I did) 928 pounds of cocoons, and would have sold them at 1 fr. 50 c. a pound, according to the price of that time: this sale would have produced, - - - - - - 1,392fr. 00c.

Deduction of expenses, purchase of about 8 ounces of eggs at 3 fr. - - - -	24fr. 00c.	895 75
Expense of all kind for the management, - - -	171 75	
Price of 160 quintals of leaves at 4 fr. - - - -	640 00	
Rent of the room, -	60 00	
His part of the profits for 40 days attendance, - - - - -		496 25

3. The *filateur* (or reeler) who buys the cocoons, obtains a quantity of silk equal to mine, and sells it in the same manner, - - 1,868fr. 55c.

He draws from the remains, -		115 00
Total, - - - - -		1,983 55
It is necessary to deduct from this sum as the cost of 928 pounds of cocoons at 1 fr. 50 c.	1,392fr. 00c.	1,655 85
Expenses of the filature,	263 85	
Clear gain of the reeler, - -		327 70

4. The laborer, with a family, takes for his share the remains of this filature, employs his wife and children to prepare and wind the low and different qualities of silk, which are in much request and readily sold. These products can be valued, after having received all the suitable work, 165fr. 00c.

Deduction for the purchase of the first materials, -	50fr. 00c.	80 00
Hand work, although gained by the family, - - - -	30 00.	
Profit, without including his work already paid, - - - - -		85 00

A simple recapitulation will make the result better understood than this division of the labor, which division certainly agrees, in many cases, with the taste or situation of persons who neither wish, nor are able, to undertake all parts of the business.

The land owner who sells 160 quintals of leaves at 4 fr. receives,	640fr. 00c.
The person who buys them and manages the raising of worms, gains,	496 25
The reeler who takes charge of the cocoons, winds them, and receives for his labor, - - - - -	337 70
The laborer who works up the remains does the labor for 30 fr. and gains besides, - - - - -	85 00
Sum equal to the total profit which I have made by the union of all these operations, - - - - -	1,548 95
Equal to	$288

The position of Rodez, in the south of France, (though farther north than silk has heretofore been generally or usually cultivated,) may induce the opinion that the climate agrees with its latitude, and that the culturist in Virginia would be less advantageously situated. We have no doubt but that our climate is better for silk than that of any part of France, and very far superior to that of Rodez. For more full evidence of the unfriendliness of the latter, we will add an extract translated from another French writter, M. Huzard, who cites this statement of M. Carrier's, and maintains that the position of Rodez is as cold as that of even the *northern* parts of France, the fitness of which for silk-culture he was adducing facts and arguments to maintain. His words are these:

"I will cite, on this head, a new culturist, under a climate which, comparatively, and because of the great elevation of the land above the level of the sea, is much more rude than the climates of the north, [of France,] and which consequently ought to be more disadvantageous to silk-worms and to mulberry trees."

The writer then copies the statement of profits given just above, and adds, "I ask if this is not a great product, and well worth the trouble of attempting to obtain the like. I do not think that any one will object that M. Amans Carrier is in the south of France, and in a climate more favorable than the central and northern parts. The climate of Rodez is a rude climate, and one much more disadvantageous, certainly, than that of Paris."

From the New England Farmer.

PROPAGATING PEAR TREES FROM ROOTS.

Extract of a letter from VAN MONS.

I now propagate for myself and intimate friends, the most choice varieties [of pears,] which I obtain by *means of the roots*. Not a single one fails, in this new process. It is immaterial in what manner they are set out. This method was discovered accidently, in consequence of some roots, on which I intended to graft other kinds of pears, being thrown on the ground and covered with a little earth, to preserve them until used for that purpose, and which were lost sight of and forgotten until the next spring, when all of them sent up stocks, which, in the autumn, were as tall as those raised from the seed, of two year's growth. They can be set out in the spring as well as autumn. If I had sooner known this method, I should not have lost a single one of my new varieties of pears,—for roots could have been taken from all the kinds, in my large plantation, at the time of its destruction.

Such roots should be selected as have one or more terminal fibres, and those that are often cut off, or left in the earth, when a tree is transplanted, succeed well. They cannot be too small, but should not be larger than the finger. The wounds at the large ends of the roots should be covered with some composition, to protect them, as in grafting. They must be set out obliquely.

MEMORIAL OF THE INTERNAL IMPROVEMENT CONVENTION TO THE GENERAL ASSEMBLY OF NORTH CAROLINA.

To the Honorable,
The General Assembly of N. Carolina.

The undersigned have been deputed a committee to present to your honorable body a memorial, expressive of the views and wishes of a large and respectable portion of your fellow-citizens, recently assembled in the city of Raleigh, in convention, upon the important subject of improving the internal condition of the state. In the discharge of this duty, we feel well assured of receiving a favorable hearing, as well in respect to the numerous and patriotic body whose views we are especially charged to present, as from the subject, which addresses itself so powerfully to the representatives of the people, to whom has been committed the high trust of guarding the interest and advancing the prosperity of our common country.

What is the present condition of the state? What its means for improvement? And in what way are these means to be most effectually applied? These are the interesting questions to which we have been directed most respectfully to invite your attention; and which, as your memorialists humbly conceive, are of such high public concernment. In examining into the condition of the state, whether we advert to the past, or view the present, whilst much may be found to warm the breast of the patriot, there is but little to gratify the pride, or to stimulate the enterprise of the citizen. We may, indeed, proudly boast of the exalted character of the nation, and claim for our citizens the most devoted attachment to the union of the states; that there has been engrafted into our own constitution those principles of rational freedom, the soundness of which has been so fully proved in the success of that representative system which constitutes our pride and boast as a nation; conferring a degree of freedom on the governed unknown in the old world, and securing to industry its rich reward, peace and plenty; that the increase of our population, agriculture, manufactures, and advancement in the arts and sciences; and in civilization, have been rapid beyond all example; that these national blessings inspire confidence as to the high destiny of the republic, and call forth sentiments of gratitude to the Supreme Disposer of all events. But whilst we may thus boast of our rapid advancement as a nation, we regret to say, our own state shares but little in this general prosperity. To prove this, facts must be submitted, however mortifying to our pride, or painful to our feelings. In the apportionment of representatives among the states, under the first census, North Carolina and N. York were equal, each having ten members. What is likely to be our rank in comparison to New York, under the census soon to be taken, embracing a period of fifty years? She will have exceeded her forty members, whilst our state will retain, or barely exceed, her original ten. What a startling contrast! Yet, in point of territory, North Carolina has her fifty thousand five hundred square miles, whilst New York only exceeds it by two thousand one hundred and twenty-five. At the first period, our population was nearly equal; whereas, at present, she will exceed two million, whilst ours will be but a fraction beyond seven hundred thousand. Yet this immense difference is not to be ascribed to our climate or soil, but in part, at least, to the rapid tide of emigration. There, every thing has been done to improve the condition of her people—here, our citizens have gone, with the bible, encyclopædia, and the axe, those pioneers of civilization, to give population and character to the wilderness of the west. In this way, more than half a million of our people have left the place of their nativity, and carried with them wealth, talent, and enterprise. It may gratify our pride, to be told in one congress there were nine senators, native born citizens of N. Carolina; yet the fact only proves how much we have lost by failing to render our people prosperous and satisfied at home.

We might pursue this inquiry still further, and examine into the rapid growth of our sister states; but we flatter ourselves that you, as we feel assured every patriotic citizen, to the question, whether the state shall remain in her present condition, are prepared to reply most emphatically, NO! If so, this brings us to the second inquiry, an estimate of the means of the state.

Stocks.

In the Bank of the State,	$500,000
In the Bank of Cape Fear,	520,000
In the Buncombe Turnpike,	5,000
Roanoke & Cape Fear Navigation Companies,	82,500
Wilmington and Raleigh Rail-Road,	600,000
Bonds for the sale of Cherokee lands, in 1838, and of a prior date;	350,000

The cash balances in the public treasury are not included in the above estimates, as they may be required to meet current expenses, and other necessary appropriations. The state, then, has a capital of more than two millions, vested in productive stocks, and in bonds on interest. It is true, a part of this sum is pledged as a literary fund; but it is equally true, we presume, that no part of the principal of this fund is to be used, and that it will continue to increase, until the interest accruing on it may be called for, in purposes of education and of free schools. The state is free from debt, and has a credit supported by her natural resources, and the habits and manners of her citizens. The taxable property of the state may, as the committee think, be estimated at near two hundred millions of dollars. She comprises thirty-two millions of acres of land, which may be estimated at two dollars the acre; she has three hundred thousand slaves, which may be valued at three hundred dollars each, besides the private stocks, merchandize, and other property, subject to taxation. But it is not proposed to resort to taxation, nor is it necessary to carry out the views and plan of those, in whose name we have been authorized to address you. These matters are merely referred to show the ability of the state, and the ample means she has to sustain that credit, which it is proposed to bring into market.

Having shown the condition of the state, the necessity and demand for a change, and the means for effecting it, your memorialists are brought to the interesting question, as to what is best to be done? In answer to that question, we have to present to you that plan or system which was the result of the anxious deliberations of those in whose behalf this memorial is presented. No higher evidence could be given of the actual wants of our people, and of the demand and necessity for something to be done, than in the voluntary congregation of that assembly, whose wishes and opinions we have been directed to make known. A body comprising near 200 delegates, selected from forty counties, men of character, of intelligence, and of wealth, voluntarily obeying the call of their country, argues a deep distress in the community, and a loud demand for its remedy. The strifes and struggles of party have been silenced, and the voice of patriotism alone has been heard, invoking you to action. It is the first and dearest privilege we enjoy as a free people, that by the fundamental principles of our government, every plan for changing our condition and promoting our happiness and prosperity, both in choice and execution, must originate with or be sanctioned by the people. The plan, then, which we have the honor to present, originated with a large portion of the people, and claims your most liberal and attentive examination. Your memorialists shew, that after a week of earnest and anxious consideration, the convention agreed upon a plan which is embodied in a series of resolutions herewith submitted, and annexed to this memorial. The convention came to the conclusion, with great unanimity, that all the works mentioned in said resolutions were of a great and useful character, and constitute a system of improvements which, if begun and successfully prosecuted, would eminently conduce to the prosperity of the state, both as increasing the commonwealth and in elevating and confirming its moral and political character.

Of the merits of the general system recommended, it is proper to say, whilst there existed a difference of opinion as to the grade or class of the respective works, yet there was none as to their eminent utility and meritorious claim to the aid and patronage of the legislature. But the convention was admonished, as all must be, by past experience, that the works proposed must be brought within the available means of the state, or all would fail. Hence the necessity and expediency of a classification. In this, too, they were following the example of the national legislature, in their works of harbors and fortifications. What the nation could not accomplish with its ample resources, it was not to be expected a single state could effect, with its limited means, though confined to works within her own borders. Here then collision begins, here is the danger of failure, and here the demand for disinterested and enlarged patriotism. Hence it is deemed important that your honorable body should be fully and candidly informed of the reasons and views, which influenced the convention in recommending certain works for prompt and immediate execution. Let them not be charged with selfishness or with local preferences, but remember the difficulty of the subject and the necessity for action.

1. A guarantee by the state of five hundred thousand dollars to the Gaston and Raleigh railroad. This is not a subscription or a loan, and does not call for any expenditure. It is a mere loan of the credit of the state, upon such surety as the legislature shall require to enable the company to obtain a loan on better terms than they otherwise could do, and thus be enabled to complete their great work. This favor appeared so reasonable in itself, as to meet with but little opposition. It is deemed due to the liberal spirit of those enterprising citizens who had been willing to risk their own fortunes in so great a work. It also recommended itself to the convention, as a work penetrating to the capital of the state, there to be connected with other works, and accommodating many of our citizens in the transportation of their produce to market. Having already received the favorable action of a committee of both branches of your honorable body, more is not necessary to be said.

2. A subscription by the state of *four-fifths* of the capital stock of the Fayetteville and Yadkin rail-road. This is one of the great works in the general system, and may be considered as standing at the head of those recommended in the first class. In regard to this work, the convention had certain data, both as to its necessity, its importance to a large portion of the state, its policy, as sanctioned by a vote of the legislature and of the people, and certainly as to the cost of its construction. As to the work itself, it is to connect the east and west; to commence with a home market, from the banks of a river, rising and terminating within our own limits; to be extended for the present to the Yadkin, a stream which passes through a productive and populous section of the country, and whose product must be carried to a distant foreign market, unless this great work shall succeed. As early as 1815, the idea of connecting the waters of the Yadkin with that of the Cape Fear, received the favorable action of the legislature. But unfortunately the geological structure of the intervening country presented difficulties not then to be surmounted by a canal, with the limited means of the state. Those difficulties disappear, however, before the mighty engine of steam. The actual extent of internal communication, by means of rivers and roads, which directly or indirectly connect itself with this road, cannot be estimated at less than thirty counties, embracing at least 15 millions acres of land, and probably much exceeds that quantity. Thus will the occupants of moderate sized farms be enabled to make outfits for market in their own vehicles, and for which the power of a single horse will be quite sufficient to reach some depot on the main route. Also in securing, what every farmer in the country will know the value of, a much smaller portion of time in the accomplishment of the object. For it is to be remembered, the great advantage of the rail-ways, over all other means of conveyance is the saving of time, the annihilation of space. *Time is money*, and the attainment of greater speed and certainty, amounts, in effect, to a reduction of expense. The advantages of a more speedy conveyance, are often of greater va-

lue than the whole charges of transportation, and those advantages can never be so fully realized, as by the use of rail-ways. These are a few of the rich advantages, which are to be extended to so great a portion of the people of our state, by means of the proposed route. This produce is first to be brought to Fayetteville, whose capital will increase, as calls may be had for its employment. Where prices may be now considered low, they will rise by demand and competition to the highest rates. It is then to descend to Wilmington by means of steamboats, whose number will also multiply as has been the case on the Ohio and Mississippi. From thence it finds its way to foreign markets, through Cape Fear inlet, which, if not the best, has its advantages. The tables annexed, show the tonnage employed in the foreign trade, entered and cleared at Wilmington from October 1836 to October 1837; also the tonnage employed in the foreign trade of the ports of Norfolk, Petersburg and Richmond, for the same time, as taken from the report of the Secretary of the Treasury.

From these tables it appears, that in the year 1837, the tonnage entered and cleared in the foreign trade from Wilmington exceeded that of Norfolk 6,384 tons, and exceeded both the ports of Richmond and Petersburg together 17,694 tons. We are informed, on high authority, that the coasting trade of Wilmington employs a greater tonnage than her foreign trade. We have not the means of ascertaining its actual amount, as it is not reported. If this be true, and we believe it to be so, not only on the high authority from which we received it, but because we know the maritime trade of N. Carolina is principally a coasting-trade—it would follow, that the tonnage employed in the trade of the port of Wilmington is greater than the three great ports of Virginia, Norfolk, Richmond, and Petersburg.

The port of Wilmington possesses two advantages over most of the other ports in the United States, which cannot fail to be highly estimated. 1. It is a *fresh-water* port, and vessels are exempt from the destruction to their bottoms (unless coppered) occasioned by the salt-water worms. 2. It furnishes the most miscellaneous cargo of domestic products of any port in the union. All kinds of bread-stuffs, rice included; naval stores of every kind and of the best quality; lumber, the very best in the world; staves and heading; cotton, whiskey, &c. &c. So that vessels can supply themselves with a cargo from that port, that cannot fail to suit some market, and make a profitable voyage. Again, that steamboats have been plying on the Cape Fear as high as Fayetteville, for the last 20 years; and we are assured that no serious accident has ever occurred during the time. Like other rivers in the south, its navigation is suspended in the summer months, and so is the great Ohio. We learn that the navigation of the Ohio, from ice and drought, is suspended, on an average, six months in the year, whilst that of the Cape Fear is suspended not more than four and a half months, and that at a season when the crop is not ready for market. Such are the advantages of the Cape Fear inlet, under circumstances as they now exist.

We have said the policy of building this railroad has been sanctioned by the legislature and the people. We have only to advert to the fact of the incorporation of the company and a subscription of two-fifths, under the authority of a law of your last session. Has a single member been ousted of his place in consequence of the vote thus given? As far as we know, or have reason to believe, not one.

But we are here met with the objection; the plan proposed changes the subscription by the state from two-fifths to that of four-fifths. Why this change? The answer is to be found in the fact, that unless it is made, the road cannot succeed. A survey and estimate have been made, under the direction of the most experienced engineer in the United States, a North Carolinian feeling for his native state all the ardor and zeal of a most devoted son, from which it appears, to construct the work in the best possible mode and in the way which meets his sanction, would cost TWO MILLIONS of dollars. To raise two-fifths of this sum, by means of private subscription, has been found impracticable. But should the subscription of the state be changed, as proposed, we are well assured the amount will be most certainly taken by individuals. This is recommended not only from the magnitude of the work, its accommodation for such a large portion of the state, but from the further fact, it is to constitute one of the connecting links, the great trunk, in which others are hereafter to share. These with the convention, were held as conclusive facts and reasons to justify the change.

3. The incorporation of a company for the opening of an inlet at the foot of Albemarle sound, near Nagshead, and a subscription by the state of three-fifths of its capital stock. This work was deemed by the convention of the highest importance, from the fact of so many of the rich counties in the north-east part of the state being directly interested in its success; from the quantity and quality of the produce which would find a market through it; and from the fact that it has been long pressed upon the notice both of the national and state legislatures. Albemarle sound runs in a direct east course from the conflux of its head-waters, the distance of some eighty miles, and at its eastern extremity is separated from the ocean by a narrow strip of sand-bank, some hundred yards in width. It is navigable within four or five miles of the ocean, where its waters separate into the Roanoke and Croatan sounds, and change its direction nearly south—Roanoke island between them. These two sounds unite again, and some twenty-five miles from the point where the current of the Albemarle changes from an east to nearly a south course, they enter the Pamlico sound. From the north-eastern extremity of the Pamlico is, fifty miles distant, the Ocracoke inlet, the only navigable one for vessels suited to the coasting trade. It is proposed to throw a dam or other construction across the Croatan sound, and thus force the waters of the Albemarle to break their passage through the bank at its foot into the Atlantic ocean. It is estimated by intelligent seamen accustomed to the navigation of this coast, that through the proposed inlet, double the number of voyages may be made as are now made through that at Ocracoke. It has been estimated by a member of the convention, that the 12 counties in North Carolina, nearly all the produce of which seeks its market through the Albemarle, export not less than from four to six

millions of dollars annually. This produce consists of corn, cotton, wheat, fish, peas, and an immense amount in naval stores and lumber. These articles are nearly all of such bulk as to forbid a deposite between the place of production and sale. Hence the importance of its being received from the wharves and rivers of the producers and carried at once to the ocean for its final destination. To the fishing interest the success of the work is of peculiar importance, as the annual tribute from abroad for this article alone is estimated by gentlemen from that section of the state at $300,000. This work has also been examined and estimates made, under the authority of an engineer of the state and of the United States. They differ greatly as to the cost, which may be owing to the material and the manner of constructing the work. But however, uncertain this may be, the people in that section of the state, it is said, are willing to risk their own capital in its success, and think a subscription not exceeding 500,000 dollars by the state, would render it certain. If so, the convention was of opinion it should be granted.

4. The payment by the state of the balance, 150,000 dollars, of its subscription to the Wilmington and Raleigh rail-roads ought at once to be made. The convention came to this opinion as an act of justice to the very liberal and spirited exertions of the private subscribers, in having risked so much on their part for so great a public work, and from the certainty, as well as from the progress made, as the high profits expected, that the work must and will be finished. The prompt payment cannot injure the state, and will greatly aid a spirited portion of her citizens.

5. The survey of Neuse and Tar rivers, with the view to steamboat navigation, and if found practicable, that the board of internal improvements be authorized to contract for effecting it. Those rivers are the property of the state, the charters granted for their improvements having been long since forfeited. It is proper then, that the surveys should be had at the expense of the state, as due to her citizens, who will use them for their produce, as well as from the fact that one of these rivers is so directly connected with the prosperity of one of its markets, Washington, which has heretofore been sustained with so much spirit, but which has recently suffered so severely by fire; whilst the other leads to an old town, which has many claims on the liberality of the state, besides its direct connection with the great rail-road in which the state has so deep an interest.

6. A survey from Raleigh, *via* Hillsborough, to Greensborough, with the view to a McAdamized turnpike road, a company and a subscription of two-fifths by the state. This route is recommended from the fact, that it is to take the main line of travel from the seat of government to the western counties in the state; that it passes through two among the largest and most productive counties in the state, whose people are farmers, deal principally in the necessaries of life, own their own vehicles, accustomed to their use, and, without this road, can share but little in the direct advantages of internal improvements. Besides, it is for the present to terminate at one of the most flourishing inland towns in the state, Greensborough, which has its flourishing schools, its steam-mills, cotton factories, and in every way its population is both active and enterprising. A cheap and speedy mode of reaching a market, as we learn, would often enable the enterprising proprietor of her cotton factory to send the product of his establishment to the city of New York, and realize a profit of two or three cents on the pound. This profit would not operate to his advantage alone, but to that of the grower of the raw material. The proposed survey would cost but little; and the road, if McAdamized, would not likely exceed, according to the estimate of the board of internal improvements, $3,000 per mile, and a part of it, possible one-half, would be an ordinary turnpike, the cost of which would not exceed $200 to 300 per mile. The road, in justice, ought to belong to the state, except that experience has shown, to construct and keep up such works, calls for individual interest and attention; otherwise they constitute a continual drain on the public treasury, and end in ruin. From this line, a branch might hereafter be extended, with great propriety, to some eligible point on the Dan river; and thus give to the people in that fertile region, the means of reaching, if so inclined, the markets of their own state.

Such are the works as placed in the first class of the plan proposed by the convention; such are some of the views and reasons which influenced that body in recommending them. If any one should object, that his work ought to be placed on equally favorable ground with the most favored class, he should pause, consult the means of the state, and then ask himself, "if such a plan had been adopted but five years ago, would not my wishes now be gratified?" Time marches rapidly; and a few years, as we trust, will serve to bring into operation the whole scheme, and others, if their claims and advantages shall hereafter be disclosed and properly pressed.

Second class.—These as will be seen, contemplate a connection with the two great rail-roads now in progress, as well as with the proposed road from Fayetteville to the Yadkin. The Beaufort road, leading from the fine harbor at that place, is the most important from that fact, as another outlet will be thus opened to the ocean, and the produce of the upper country will then find additional means of being shipped to any portion of the commercial world. The inlet at Beaufort, is said to be not only the best in our own state, for its depth of water, having from 22 to 24 feet on its bar, but it is not to be surpassed by any other from the Chesapeake to Pensacola. Why then, it may be asked, was not its rail-road placed in the first class? The answer to a majority of the convention, was plain and satisfactory. It has no produce, no capital; these must be brought from a distance. One great trunk in connecting the east and west, was deemed sufficient. A road from Beaufort to Raleigh, and thence to the west, had been authorized, and it totally failed. The convention had no reasonable grounds to believe that it would prove more successful at present. Two connecting roads were too expensive to be undertaken at the same time by the state, and her true policy forbade it. Hence, the one from Fayetteville was selected as most likely to succeed, as required by the pressing demands of our western citizens, as leading to markets in which capital is already employed, and as having an outlet that might answer present demands. Again, when the western road shall reach Fayetteville, you are still on the descending line, and from thence may be carried to Beaufort. Such, it is believed, will be the quantity of produce from the upper country as will hereafter force itself to the best market. In this way, what the friends of Beaufort cannot do for themselves, will be done by others.

The loan of three millions to be contracted by the state. It has been already shown, in estimating the funds of the state, she has upwards of two millions invested in a way, whilst they will prove productive, are not likely to be embarrassed or squandered. By the system proposed, this fund is not to be touched, but to be held as a guarantee to sustain the credit of the state in the negotiation of a loan, and a surety to her own citizens against any contingency which may arise. The maximum of the loan is three millions; and the money, when borrowed, will be mostly expended amongst ourselves; and for it the state will hold certificates of stocks which will be productive, and will in themselves constitute an additional surety against any future calls upon her own citizens. These stocks can at any time be brought into market, and thus relieve the state against any pressing embarrassment. The debt will be postponed to a future period; the works will progress; the burthen will be divided betweeen posterity and ourselves; and in this way the estate which our children are to inherit will be improved, our own condition relieved, and means provided for them to meet the claim which has been entailed in order to its improvement. This accords with the most rigid principles of justice, prudence, foresight, and economy. The estate is fast going to decay; our people are not in a condition to make the necessary repairs and to improve it, without a resort to loans. This state of things has not been brought about from any want of frugality in our expenditures; of forbearance in contracting debts, or from any extravagance or want of system in the proper and judicious management of our domestic concerns. At no former period in the pecuniary affairs of the state, has there been less extravagance, and yet at no period has it been found more difficult to keep free from embarrassment. The evil is to be found not in any passing events, but in the want of a proper encouragement to the products of our soil, and in the fact that our most wealthy and enterprising citizens are driven to more genial climes.

If we look to our sister states, most of them will be found in the march of improvement, and their citizens contented and happy. Yet, they have resorted to loans; and experience proves, so far from ending in injury to the people, they have the more rapidly advanced to wealth and prosperity. And this too, without any resort to taxes; the profits from the works having been quite sufficient to meet the interest and provide a fund for the payment of the principal. South Carolina has but recently subscribed one million to her great rail-road, guarantied the loan of two millions more, and by way of relief to her favorite city from a heavy calamity, added two millions more to her debt. But we forbear to press this matter further, as it is idle to talk of embarrassing the state by contracting a debt of three millions of dollars.

If our forefathers, with not half of our means, limited as they are, when dissension, faction, and treason lurked in every neighborhood; when the property of the citizen was liable to seizure by the enemy, and to wanton destruction by the traitor, when the assassin beleaguered his path by day, and threatened his repose by night; if, at such a time, and under such circumstances, that band of patriots could bear up for a period of seven years, under a debt of seventy-five millions, let us not talk of embarrassment by the sum proposed, having, as the state has, the ability to raise it without a resort to taxation. The only question that can admit of discussion is, not the ability of the state to raise such a sum without prejudice to her citizens, but whether she, in her sovereign capacity, shall engage in a system of this kind at all. And can we, at such a period as this, with all the light of experience before us, be seriously called upon to discuss such a question? Will you leave these matters to individual enterprise, when every state in the union has undertaken the system with so much success? At the close of the memorable struggle to which we have just referred, North Carolina had her territory and her population. Her territory still remains; Mecklenburg, Moor's creek, King's mountain, and Guilford, are landmarks which time cannot raze from the page of history. But where is her population? Where the monuments of her improvement? Her population is fast leaving her, and her monuments, we fear, are only to be found in the record of things past.

Is this state of things to continue? Or are we ever to be roused to action? It is much to be feared, if you shall separate without doing any thing, the cause of internal improvement will have sustained a shock from which it will be difficult to recover. The patriotic feeling which now warms and animates the citizen will become chilled by your apathy. It is our part, in the name of a respectable portion of the people, to advise; it is for you to act. By rejecting the plan proposed, and doing nothing, you may seal the fate of internal improvements. By acting, you incur no risk that can, in any reasonable probability, embarrass the state. But you stay the tide of emigration, now draining the life-blood of the commonwealth; you stimulate the farmer to new exertion and improvement; you invite the capitalist to open the rich bowels of the earth and to bring forth its hidden treasures of iron, copper and coal; you every where encourage the mechanic and the man of enterprise; you open new streams of wealth, running in different directions, in different dimensions, and at different heights; but watering, adorning, and fertilizing the fields and meadows through which their courses are led. Again, we ask, can you hesitate? We tell you the spirit for improvement is abroad in the land; that it invites you to awaken to the true interest of the state; to burst the shackles of a jealous and short-sighted policy; to rise triumphant over physical obstacles, and the still stronger mounds of local prejudice; and by your action, to elevate our beloved state to her proper rank, as one of the political members of this great confederacy, and let her shine with a new light amid the stars of our national galaxy.

R. M. SAUNDERS, *Chairman.*
JOHN H. BRYAN,
LOUIS D. HENRY,
L. H. MARSTELLER,
HUGH MCQUEEN,
JAMES ALLEN,
T. L. CLINGMAN.

December 20th, 1838.

RESOLUTIONS OF THE CONVENTION.

1. *Resolved*, That the convention concur in the report of the general committee, that the several works of improvement therein recommended deserve the patronage of the state, and ought to be effected.

2. *Resolved*, That in order to carry out the views of the convention, and at the same time, to accommodate them to the means and ability of the state, a loan of three millions of dollars ought to be contracted.

3. *Resolved*, That in the prosecution of these several works, the convention recommend the following classification:

First Class.

1. A guarantee by the state of five hundred thousand dollars to the Raleigh and Gaston rail-road company.

2. A subscription by the state of four-fifths of the capital stock of the Fayetteville and Yadkin rail-road company.

3. The incorporation of a company for the opening of an inlet at the foot of Albemarle sound, and a subscription by the state of three-fifths of its capital stock.

Second Class.

1. A rail-road from Beaufort harbour to connect with the Wilmington and Raleigh rail-road, and a subscription by the state of four-fiths of its capital stock.

2. A rail-road from Raleigh to intersect with the Wilmington and Raleigh rail-road, at or near Waynesborough, and a rail-road from Raleigh to Fayetteville, and a subscription to each, of two-fifths of the capital stock by the state.

4. *Resolved*, As the opinion of the convention, that the balance of the subscription by the state to the Wilmington and Raleigh company ought to be paid without delay; that surveys of Neuse and Tar rivers, with the view to steam navigation, and the survey of a route from Raleigh *via* Hillsborough, to Greensborough, in Guilford county, with the view to a McAdamized turnpike road, ought to be made by the state; and if the said rivers should be found such as to justify the use of steamboats, the board of internal improvements be authorized to contract accordingly. And that a company be incorporated for the construction of the said road, and a subscription of two-fifths of its capital by the state.

Wilmington tonnage entered and cleared.

American vessels, -	12,378		
Foreign " - -	3,827		
	16,205	Entered, - -	16,205
American vessels, -	25,600		
Foreign " - -	3,929		
	29,529	Cleared, - -	29,529

Virginia tonnage entered.

Petersburg, American vessels,	3,693		
Richmond, " " -	2,822		
Foreign " -	1,197		
	7,712	Entered, -	7,712
Norfolk, American vessels, -	4,357		
Foreign " -	10,000		
	14,357		14,357

Virginia tonnage cleared.

Petersburg, American vessels,	2,748	
Richmond, " "	13,240	
Foreign "	4,340	
	20,328	20,328
Norfolk, American vessels, -	12,771	
Foreign " -	12,222	
	24,993	24,993

ON THE OPERATION OF MAGNETISM, AND OF TIME, IN IMPROVING THE TEMPER OF STEEL AND THE SHARPNESS OF FINE EDGED INSTRUMENTS. A CERTAIN CURE FOR THE PILES.

To the Editor of the Farmers' Register.

Watkinsville, Clarke co., Jan. 26, 1839.

I read somewhere, a long account of the reason why a razor dipped in hot water shaved easy. The writer concluded the reason was very plain; for, said he, by way of illustration, it depends upon the same principle why a hot knife cuts butter or cheese more easily than a cold one; it melts and softens as it goes, thus making a way for itself. This observation induces me to send you a disertation on shaving, which may be, like the disertation on man-midwifery, fit to be read sometimes, if not at all times.

Is it commonly known—have I learned it somewhere and forget where, or is it an observation of my own—that surgeons' instruments, razors, or any instruments requiring a good temper and fine edge, are greatly improved by being charged with the magnetic principle? If it is new, it should be made known that the load-stone can improve the temper of steel far exceeding any other known plan. The effect it has on the edge of a razor, lancets, or any thing of the kind, is astonishing. Charge a needle with magnetic principle, make it sharp, and give it to your good wife, and she will notice the difference. Therefore, the first step towards taking off the beard easily, is to have the razor rubbed with load-stone.

Again, it is a known fact, that newly tempered steel is always defective. It improves with age, and, I believe, would continue to improve to an unlimited number of years. This fact is commonly known; but a wromg reason is given for it. It is generally believed, that in old times the tempering of steel was better understood than at this day. It is a common belief among surgeons, that old London instruments were better made than they are in this country; that they are better, is certain; but it is age that has improved them. Facts in proof of this position, every body can call to mind. I will, however, state a few that have come within my own knowledge. More than 25 years ago, I had a set of dissecting knives made by Brown of Philadelphia. He was directed to make them as good as they could be made, and to charge double price for them. They were found, upon trial, good for nothing, were thrown aside, and after remaining for many years neglected, I had the rust cleaned off, and sharpened. They are now as good as the best I have ever used. About twenty years ago, I had a couching needle made of a singular form, by a black-smith. The operation of couching for blindness requires a well tempered instrument; the point must be perfect. After having it several times tempered over, I found it impossible to bring it to a perfect point. It was thrown aside as useless; not less than a half dozen times I sent to the north, and had new needles made, directing two or three prices to be offered for them, so that they might be made of the best kind; none of these instruments were as good as I wished them to be. As I frequently practice this operation on dead eyes, as well as on brute's eyes, to save my new instruments this old needle was cleaned of rust and sharpened again; and upon trial, it was now found to be the best instrument I have. I have, of late, operated successfully on perhaps a dozen blind eyes with this old instrument, and I should certainly consider it the best instrument I have seen. Some time ago, I went from home to amputate an old man's thigh. I had to use a borrowed set of instruments; and when I examined them I hesitated whether to operate. They looked so old and rough that I feared to use them. As the knife, however, appeared to take a fine edge when strapped, I proceeded to operate. After I had cut down to the bone, I passed the knife several times round the bone, pressing it hard, that the bone might be perfectly clear. As I calculated I had destroyed all edge on the knife, I concluded I would sharpen it before I returned the instruments to the good old worn out surgeon. To my surprise, I found, upon examination, that the knife still retained a perfect razor edge. I tried these instruments many ways to try their temper, as I considered them the best I had ever seen. I went to see the old gentleman, determined to own them at any price; but they could not be purchased. He informed me that they were a very old set of instruments when he was a young man and a surgeon in the army. He told me of several high officers' limbs they had amputated; that they had done much service since he had them, and that they were considered old worn-out instruments when he received them. I now inquired if he valued them because they were of superior temper. He told me they were the only ones he had ever used, and that he did not know that they were better than common; that he only valued them for their age. These are the best tempered instruments I have ever seen, and the oldest. When new, I have no idea they were better than common; in fact, every person in the habit of using tempered steel or iron, in any way, will be able to recal facts to prove that the older they are the better. It may be laid down as fact, that a newly made razor will seldom shave well, and that the older the better. Therefore, in selecting a good razor, an old rusty razor will be generally better than a newly made one; for rust also improves the temper. But even with the best mechanics, a perfect temper is only an occasional good hit; and many razors may be tried before a good one is got. The old-fashioned direction, to buy many cheap old razors, and keep trying until we get a good one, is a good direction.

Time, or age, has an effect on the edge of a razor that no art can produce. The instrument-maker, after grinding and honing a razor or other instrument, gives it a slight strapping on a bad strap, and it is finished. Now, this newly tempered razor, fresh sharpened, could not be made to shave well. The instrument-maker knows if he straps off the wire-edge he leaves it rough like a saw, full of little gaps. It would now shave very rough, but it may be months or years before the shaver uses this razor, by which time age has entirely taken off the wire-edge and left a smooth fine edge. Time takes off the wire-edge perfectly. No art can. Therefore, when we buy a new razor, (for this new razor may have been made many years,) we should select a sharp one, for we may never get as good an edge on it again; this edge should be saved as long as possible, never putting it on a strap while it will do without. By only strapping it on a clean silk handkerchief, or the palm of the hand, if the razor is a good one, it will keep its edge a long time.

But after the razor has become dull, the object is to sharpen it, and make it shave well. Observe, although time has put a good edge to the razor, the maker did not. For, in addition to other reasons why he cannot put on a good edge, his strap is in such frequent use with newly ground instruments, that it is full of particles of wire-edge, stuck in it, which, if the razor is much strapped on it to make it perfectly sharp, will make it worse. Sending a dull razor to the instument maker to be sharpened for immediate use, will always result in disappointment; therefore, this must be done at home. Every man with a hard beard, who wishes to shave easy, must keep more than one razor. Now to sharpen it, the hone must of course be a good one, and for the most part, a fine oil-stone is better than any hone. Thick oil is better than thin; therefore, use caster oil in preference to olive oil. Now bear particularly in mind, that it is wholly impossible to put a good edge on a razor if it is well tempered while cold. Rubbed as gently on the hone as we can, the edge will fly. After sharpening, pass it along the thumb and it will be rough. Examine it with a microscope, and the edge will be found full of little gaps, and an irregular wire-edge. Rub off the wire-edge, and it will be rough and wholly unfit for shaving. The only way to guard against this, (and without this caution to put a good edge on a razor is an impossibility,) is to put the blade in hot water. Make it as hot as boiling water can make it, and rub it gently on the hone with little more than its own weight, frequently dipping the blade in boiling hot water. Now if the razor is a good one, and sharpened in this way, the heat of the water expands the metal and thickens the edge so that it may be brought to a very fine edge; while at the same time, heat so toughens the edge that it will not fly. Examine it with a microscope, and it will be found to have a smooth regular edge, with a very fine wire-edge all the way; for the edge becomes so perfectly fine, that the very extreme point (so as to say) of the edge, has no substance to wear it off; and, therefore, turns up all along. Now, how to take off this fine wire-edge. Every strap-maker gives directions; and every direction, if followed, spoils that fine smooth edge that is essential to easy shaving. Rub it across the thumb nail, as directed, and examine it with the microscope, and we have broke off the wire-edge in places and made the blade full of little gaps, while in other places, we have turned the fine edge and made more wire-edge than before; go to strap it off, and, by much of the wire-edge breaking off and sticking in the strap, the strap is ruined and rendered unfit to put on a really fine edge any how, and the razor made, in reality, worse than before. There is only one way to manage this wire-edge so as to enjoy the luxury of easy shaving in full perfection. Time is the best and only doctor; therefore, bear in mind this direction: after the razor is sharpened as above directed, wipe it perfectly dry, not touching the edge with any thing, and above all things, not touching it on a strap; put it in the case or wrap it up, and put it away. The longer it remains untouched, the better; but three months at least will be required, for time to take off this wire-edge. How time acts upon the razor's edge is not the question, (although it admits of explanation;) the fact is what we want; and who ever will try it will find it so. After letting the razor remain three months or longer untouched, it is now fit for a shaving; but before beginning, tie one end of a silk handkerchief to something, holding the other in the hand, and strap the razor sometime on it, then on the palm of the hand; let the razor be cold during this strapping, as we want a little brittleness about it, that any particles of wire-edge which might still remain may break off, thus preventing them from sticking on the strap and spoiling it. Now dip the blade in boiling hot water and apply it to the smooth side of one of Mechis' magic straps, lathering the face and dipping the razor in hot water as usual; and the beard may be mowed off not only so easy that it cannot be felt, but the razor will shave so perfectly easy and smooth, that it will shave the beard *lower than the surface of the skin.* is as absolutely necessary, if we wish to shave in full perfection, to dip the razor in boiling hot water while strapping, as it is while honing it.

Now there is another important item to be noticed, if we wish to shave easy, no matter how good the razor is, and how well all these preparatory steps are followed. Constant use injures the temper of the razor, and if it is not rested it will fail to perform well. Metals when frequently strained loses their tone, and require time to recover. A spring in constant use weakens, but recovers from rest. Sportsmen know, that by very often shooting, their guns and rifles become what they call crazy, and will not shoot well until they are rested. Razors that are kept in constant use are so often heated with warm water, and thereby expanded and put on the strain, that after a while they lose their tone or temper, so that they will not bear as good an edge as they before did. It requires something like three months rest for them to recover their temper again. So that if the plan be adapted of always using several razors, and whenever one is honed, letting it remain three months or more before it is used, it will also recover its temper, and it will not become too soft from constant use. Not only will the man who has a rough beard find benefit from the position I lay down, that steel or other metals are not fit for use immediately after tempering, but others who have use for well-tempered instruments or tools, will derive benefit from observing it. The farmer who will, as soon as he has finished his crop, have all his ploughs pointed and tempered, and put up till next year, will find that the points that he has had on a year will last nearly twice as long as those that are put on and put into immediate use.

But why does the razor shave more easy by dipping in hot water? It cannot be from its softening or melting effect on the beard; for, after the beard has been well lathered with soap and warm water, it is hardly presumable, that what heat might be in the razor blade would soften it much more. In addition to which, it is perhaps noticed by most of men who have hard beards, that the razor will not shave so well if it is too hot; to shave easy, it must be dipped in hot water, and then *getting cool* before it is applied to the face. Two reasons should be given in explanation: first, because when the razor is used cold the temper is so high and the edge so fine, or thin, that it will fly and become full of little gaps; whereas, by dipping it in warm water the heat expands it and gives it a little toughness, or by softening it a little takes away that extreme brittleness which makes it break. Shave with a razor that is hot and one that is cold, and examine them with a powerful microscope, and the difference will be very plain. Again, if we consider the shape of a razor blade, and consider that heat expands, the back is much thicker than the edge, and will retain its heat longer; therefore, the back more heated and expanded than the edge, would cause the edge to be on a strain and brought to a more perfect edge. In dissecting out large tumors and other surgical operations, where very sharp knives were required, I have always kept the knives in a bowl of hot water, and changed them as they became cool.

I will now give you a medical prescription, if you do not think it too much out of place. I would wish it published, too, for those who may be so unfortunate as to have use for it. If it acts as kindly with them as it has with me, it will be invaluable. Having to practice physic in a rough country, I had to ride on horse-back. Although I always secured the most easy saddle-horses I could procure, yet I soon found constant riding produced piles. I could not begin to describe how much this wretched disease has pestered me, not only in point of the distressing pain I suffered, but at the very times when I was most busy, and my services most wanted, this unwelcome affliction would be most afflicting. After disabling me from attending to business, or causing so much pain that I felt like any thing else more than attention to professional duties, I thought I had tried every plan that the ingenuity of man could suggest, without doing much good or harm. As a last resort, that nothing should be left untried, I sent to an old woman, who was noted for curing piles, for some of her infallible ointment. Fearing I might lose confidence in the old witch's remedy, which she affirmed never failed, I used it as she directed, without examining its composition. As it did no good, I then examined it, and found it to be lard, rubbed with a lead pestle. As my own treatment, as well as all other plans suggested by medical men, did no good, I endeavoured to become reconciled to endure it, hoping at any rate, it would get no worse. In this I was disappointed, for although the many remedies tried did not cure, yet they kept it at a check; for so soon as I gave over trying, it became rapidly worse. I now, from theorising on the disease, concluded to try a plan which, to me, was new. I have never, that I recollect of, seen or heard of its being tried before; but be it old or new, its success is the object. When tried, it acted as a balm, and so far, as a perfect cure. It is this: Take a piece of patent lint, or linen cloth, spread upon it some Turner's cerate, (some tallow or any mild ointment would do as well,) in the middle of the plaster put some calomel, say 20 grains, and every night apply it to the piles, letting it remain all night; the relief will be almost immediate. Continue it till cured, and when the disease appears disposed to return, apply it again. I have recommended it to a number. Calomel, to piles, is as certain a cure as tooth-pulling is for tooth-ach, and the only remedy I know of worth using.

ROBERT R. HARDEN.

For the Farmers' Register.

MARSH-MUD AS MANURE. BLUE MARL.

In the last No. of the Register, you solicit information in relation to the application of marsh-mud; I have made several short communications to the Register on this subject, and have but little to add.

I commenced the use of marsh-mud, on a large scale, in the year 1828, and have never been disappointed in its effects. In stating my opinion of the relative value of marsh-mud and marl, in 1834, I observed that mud would cease to benefit, after a few years' cultivation. Experience has convinced me of its more durable effects, and I now say, with confidence, that mud taken from a ravine, on a salt-water river, where vegetable accretions, and the washings from a good soil, have gradually surmounted the tide, is more durable in its productive qualities than stable or barn-yard manure.

I made a small experiment with marsh mud in 1824. Last season I cultivated the field in corn, where the mud had been applied; though by reason of the drought, nothing grew well, the durability of the improvement was manifest, by comparing it with the corn on the adjacent lands. This year I propose applying marl to lands heretofore covered with *marsh-mud*; and, if your theory be right, that marl will give permanent effect to putrescent manures, I calculate those lands, under a moderate system of cultivation, will, for a long time, require no farther improvements. That lands should be manured for every crop of wheat, as they are in Pennsylvania, I readily agree; but in a country which depends almost exclusively upon grain, labor has become a very serious matter. The free people of color, for the most part, go to the cities, where their career is generally short and we cannot purchase slaves at Mississippi prices. I have no knowledge of the profits of slaves sold to the planters of the south; but I know of no instance of a successful emigrant, with his slaves, from this part of the country. Some of them, after a short absence, have returned with large credits to purchase slaves, and with very seductive accounts of the profits of cotton and sugar plantations. A few years have generally sufficed to wind up the concerns of these adventurers, by death, or insolvency, and generally by both; and I am much inclined to think that if the slave-holding emigrants, or their representatives from this part of the country, could settle a general account, they would find the balance as much against them as it was with the Baltimore privateers-men at the conclusion of the last war. I do not mean to say, that all who go to the south fail. A sharp fellow, whose morals subserve his wits, will make money at any place where he has room, and his success (at least for a time) will be certain, if he has the good fortune to get to be a director of a paper bank. But a Virginian or a Marylander, who had grown up under the influence of moral habits, and checks derived from his parentage and education, would feel strange in a country where the Lynch-law is part of their code, bowie knives of their dress, and where whigs, democrats, nullifiers, members of the legislature, members of the church, and ministers of the gospel, circulate "Oakland notes," he would hardly feel himself justified in taking a hand in this game, or as if one of these holy men, would join him as a partner.*

I know a gentleman of this state, who, from small beginnings, by prudence and industry, had realized a handsome fortune, sufficient to supply him with all the comforts and many of the elegances of life; he had also been a successful politician; and in a evil hour, was induced to think, by bad advice, that his time and capital was misspent in cultivating tobacco, wheat and corn, on a beautiful farm, which had been improved under his care and direction. To make his fifty thousand a million, he purchased a large tract of land, on some of the waters of the Mississippi, and sent his son, with a large number of his slaves, to settle. The last account I had of the concern, was, that the entire crop of corn and cotton had been ruined by the overflow of the river, seventeen of the slaves had died of fevers, generated, by the malaria, and that the son was slowly recovering from the fever of the country, which at one time, left but little hope of life.

I feel a paternal regard for cultivators of the earth, and to those of them, who shall at any time feel a desire to become rich, by the growth of three, or four crops of cotton, or two or three of sugar, and then return to their native plains, to enjoy *otium cum dignitate*, I recommend Æsop's Fables. They are all of them entertaining, and some of them well suit their case. I recommend this book, in sober earnestness. I learnt from it in my youth, lessons of practical wisdom, some of which have served me in my journey of life.

In communications heretofore made to the Register, I have suggested that blue-marl, contained properties fertilizing beyond the lime contained in it. Farther observation has confirmed the opinion. I have worked, principally, two pits, one of blue, the other of yellow-marl. Professor Ducatel reported the latter to be richest in lime. I have applied the marl from those pits to land equal in point of fertility, and exhaustion, and have always found the fertilizing effects from the lands covered with blue-marl, more quickly disclosed, and exceeding in product. Your Professor Rogers, in the 3d vol. of the Register, page 634, in speaking of blue-marl, suggests that its coloring appears to consist of carbonaceous matter, derived, probably, from the organic materials, associated with the shells, which imparts to it, fertilizing properties. The qualities and the quantities of substances combined with matter used in agriculture, was a matter of diligent and successful inquiry, by Sir H. Davy; and I should think, the constituents of blue marl, well worth the inquiries of your Professor Rogers, and our Professor Ducatel, both state geologists. What salaly Professor Rogers receives from your state I do not know; but Professor Ducatel's from ours, is fully adequate, and I think, the inquiry within the scope of his duties. RUSTICUS.

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* See Dr. Hagan's letter on Mississippi banking, in Farmers' Register for December, page 729.

E. S., Maryland, Feb. 1*st*, 1839.

[The supposition of our correspondent, as to there being some other useful ingredient than the calcareous part, in blue marl, is doubtless correct. But whether the additional value thence derived is enough to be appreciated, is more than we can say. The observation of the particular facts, which will be stated in the following article, first pointed out to us, and satisfactorily, that it was the dark colored extract of vegetable matters which gave the blue color to shell-marl. And this coloring matter is undoubtedly chemically combined with the calcareous matter, and cannot be removed by any washing with pure water. The proof of this is, that in all the pits dug into the very remarkable blue marl, described below, on Shellbanks farm, water, in great quantity, passed through every part of the mass, without there being the slightest effect produced in lessening the deep tint of the marl, or affecting the purity of the water. Further—in the well dug through this bed of marl, and which received its principal supply of water from a soft quick-sand beneath, the water rose to and stood at the height of about 13 feet, and altogether in this blue-marl. Yet the water was at first, and has continued to be, remarkable for its purity and excellence.

The following statement was written to form a part of the second edition of the 'Essay on Calcareous Manures,' and was one of several portions omitted, because it was desired to include nothing that was extraneous, or not sufficiently sustained by fact or reasoning. But though no similar particular observations have since been made, nor any experiment tried, it is proper here to state that nothing has been since learned to cause doubt of the then supposed cause of the color of blue marl; and that the time which has elapsed, and general observation, have confirmed, what then was doubtful, merely because new.—ED. FAR. REG.

THE BLUE COLOR OF MARL PROBABLY CAUSED BY THE PRESENCE OF VEGETABLE MATTER.

[An omitted note, written for the 'Essay on Calcareous Manures.']

A fact which has very recently fallen under my observation, seems to throw light on the cause of the blue color of some marls. I will, however, merely state the facts, and leave it to others to reason as to the causes.

There is one body of marl at Shellbanks of very uncommon appearance. The upper part is dry and yellowish, soft, and as fine and even more yielding than sand; which is similar at the tops of many other beds. Below, it is wet and firm, but still yellow for some six to ten inches. Still lower, and without any perceptible change of texture, there is a sudden change of color, precisely to a line, (though not quite a horizontal line,) to a deep and beautiful sky-blue; by far the most perfect blue known in marl or earth of any kind. This color continues to the bottom; as was known by having dug a well through it at a few hundred yards distance. Beneath the marl, there is a brownish quick-sand, from which an abundance of pure water rose. It may be well to observe here, that whenever marl is blue, there is no other color known beneath; and it certainly was the lowest in two other remote bodies, through which I reached the bottom, on another farm. The bottom of this bed (at Shellbanks,) could not be reached, except in the well, though many pits were dug 6 to 7 feet deep in the blue marl. The whole of this wet marl, (yellow as well as blue,) consists of alternate thin layers of a fine and close calcareous clay, (apparently the true marl of mineralogists,) and of finely broken fragments of shells, few of which are larger than grains of wheat, and generally much smaller. The layers of clay vary from one-eighth to half an inch in thickness, and the layers of powdered shells fill from double to triple these different spaces. The digging is on the edge of an alluvial flat, which above is a wet swamp; and a stream passes by the marl, and nearly as high as it is wet. In digging pits, the water passed so fast through the porous layers of broken shells, and from every side, that it was very difficult to sink the digging even to 6 or 7 feet; and to get to that depth, there were, towards the last, two men kept constantly throwing out water to enable two others to dig and throw out marl.

From another body, about 400 yards distant, which was of different appearance, and showed no blue color, even at the lowest known depth, where also it was wet, some of the upper dry and fine part was taken in 1833, to floor a stable yard, for the purpose of absorbing and saving the liquid manure. The marl was covered with vegetable and animal manure, and sometimes with such filth from about the houses, as well as the cleanings of the stable. About 12 months after it had been so placed, this once yellow marl was dug into, and found to present the same deep and beautiful blue color of the former body described.

THE LAST COMMUNICATIONS OF GEORGE E. HARRISON, OF BRANDON.

The following communications were prepared just before the sudden illness which resulted in the death of the writer, only five days after the date of his letter; which event deprived the country of one of its most useful and valuable citizens. We speak of George E. Harrison solely as an improver and cultivator of the soil—in which respects his labors were among the most beneficial to the agricultural interests of Virginia, of all such that have been performed. It does not comport with the design of this publication to remark on other subjects for encomium, however highly deserved; and it is especially requisite that we shall not be tempted, upon any occasion, to admit any such obituary notices as are customary in newspapers, which, by the frequent abuse and prostitution of praise, or want of all discrimination in applying it, have become as mere words of form, having neither fitness of application, nor truth.

Mr. Harrison's communications to the Farmers' Register were always valuable; but his too great diffidence, and his shyness of public observation, and misplaced fear of criticism or censure, restrained his pen within limits much more contracted than our wishes or the public interest would have required; and the additional value of his real signature was never permitted to be given to any one of his communications. As his scruples, on this head, (as all but himself would have considered,) were altogether misplaced and unnecessary, we shall take permission thus to state the authorship of the short communication which was designed to be published as anonymous, and also to give the letter which was meant to be altogether private. There is nothing in it that is improper to be *thus* and *at this time* presented; and the contents will be the more interesting on accounts of the fact, that before the letter was closed, or indeed entirely completed, that the writer had ceased to live. The blanks for numbers, as shown below, were left thus in the writing, to be filled by particular reference to accurate accounts of actual expenses. From Wm. B. Harrison, esq., from whom the letters have just been received, we learn that the writing of what follows was one of the last acts of his lamented brother.

The tenor of the inquiries which drew forth this letter may be inferred from the answer. The "Byrd manuscript," the publication of which, entire, we had urged on the possessor, is a folio volume of the writings of his distinguished ancestor, Col. Wm. Byrd of Westover. By the favor of Mr. Harrison, we had formerly been permitted to extract the portion of this old and curious volume, which gives the journal and account in detail, of the earliest passage through the great Dismal Swamp. (Vol. iv, p. 593, Farmers' Register.) We shall accept (if the offer be still available,) with great pleasure, the use (as restricted,) of this precious volume; and in making use of it, will comply carefully with the wishes and directions of the deceased proprietor.—ED. FAR. REG.

EDMUND RUFFIN, ESQ.

Brandon, January 14th, 1839.

Dear sir—I received your message by my brother, and subsequently, your favor of the 4th ult. I very soon prepared a reply, but it was so meager and unsatisfactory, that I permitted it to remain in my pocket, intending, so soon as I got opportunity, to put it in better form, and forward it to you. The engagements, however, of company and of business, have heretofore hindered me. I generally find Christmas a most harassing period, from the needful preparations for the coming year, as well as winding up the affairs of the past. These difficulties have been enhanced on the recent occasion, by my parting with a manager who had been eleven years in my service, and who had so thoroughly identified himself with my business, that I have found it hard to get along without him. Although the causes of delay I have detailed still exist in some degree, I cannot consent longer, even to *seem* inattentive to your wishes.

I should not like to engage in the publication of the Byrd manuscript, even if I felt entirely at liberty to do so. I placed it some time ago, in the hands of some gentlemen in Richmond, with authority to extract such portions as they thought proper, for the use of the Historical Society of Virginia; and I have heard that $40 had been expended in copying the selected parts. Were I so inclined, it would be necessary to confer with them before I could undertake the publication of the whole work in an independent volume. I do not, however, consider myself precluded from allowing you to publish as much as you think proper, in the Register, only stipulating before-hand, that the *relique*, which I greatly prize, shall not leave your house; that the parts chosen for publication, shall be carefully examined by you, and such alterations and corrections made as the form of the author may require; and finally, that copies in manuscript be taken for the press, instead of printing from the work itself. With these conditions, it will be entirely at your service, and I will forward it to you by the first safe conveyance.

I had rather postpone for a while, a report of my experiment with the camel-lighters in the transportation of marl. I, for some time, suspended that operation, and have but recently resumed it. I will endeavor to make some observations which shall enable me to enter more into detail than I now can. My business is so extensive, and generally, so pressing, and my amusements, *proh pudor!* so attractive, that I do not attend much to the minutiæ of things. I do not consider camel-lighters at all adapted to distant, and not well to river transportation, owing to their being unmanageable, and too much at the mercy of the wind and the tide. Their ease of draught renders them particularly suitable to shallow creek navigation; and for the purpose you mention, viz: the removal of marsh-mud, I, on the whole, esteem them preferable to any description of lighter, and beyond comparison so, but for two or three objections, which are so cogent as to bring the shallow open scow into powerful competition with them. The objections to the camels are the necessity of using pumps, which are so apt to get out of order in the hands of negroes, the difficulty of stopping leaks when they occur, and should one accidentally turn over, of uprighting it. One would suppose, to look at the broad flat things, that the latter casualty never could occur; but it nevertheless, did to one of mine, and the trouble of restoring it is hardly conceivable. My lighters are 40 feet by 12, and rather more than inches deep. The cost , complete, I think, fully $. One of three-fourths the size specified, and of thinner plank, would probably answer your purpose. I merely guess at the cost, which may be very wide of the mark. A great deal of timber is required, as every particle of sap should be rejected except from the bottom planks.

In regard to marsh-mud I have had no experience either by itself or in compost; perhaps, having been deterred from using it by Mr. Lewis' failure, which I considered decisive. If I find it convenient, I will, with pleasure, try the experiments prescribed by you, and report the results; though we are generally so much *pushed* as to have but little time for *projects*, however rational they may be. I am of opinion, that oyster-shell-lime unslacked, costs us at the kiln   cents a bushel. The enclosed letter may, perhaps, enlighten you as to the price of stone-lime. I send the letter with a short article by way of introduction, which you can use if you deem them of any value. All I recollect of Capt. B. is, that he once took off a cargo of corn here, and that he seemed to be a respectable person, between whom and ourselves some civilities were interchanged, to which circumstance, I suppose I am indebted for the letter. Till the receipt of it, I had even forgotten his name.

I cordially reciprocate your expressions of friendship, and shall always be happy to meet you at home or abroad, but more especially at this place.

With kind wishes, I am, dear sir, truly yours,

GEO. E. HARRISON.

THE USE OF IMPORTED STONE-LIME PROPOSED IN LOWER VIRGINIA. LIME FOR HOGS.

To the Editor of the Farmers' Register.

I herewith send a letter from Capt. Lewis Bosworth, of Newark, N. J., whose object in addressing me will probably be promoted by its publication in the Register; and as it may be of service to some of your readers, the benefit may be reciprocal. The information it imparts comes very opportunely. The supply of oyster-shells is precarious, and entirely inadequate to the demand. Marl, doubtless the most valuable calcareous dressing, is not every where to be had, and is a heavy and expensive affair when both land and water-carriage have to be encountered. If fifty bushels of stone-lime, in the state and at the price mentioned by Capt. B., will suffice for an acre, it will be cheaper than the customary quality of shell-lime; viz: 72 bushels. If a like quantity be required, it will be rather more costly, but will present the great advantage of being attainable at any time, and to any extent. I have ordered, for myself and one of my neighbors, a small cargo, by way of experiment, and you may again hear from me on the subject.

Is it known that lime—shell-lime I mean—is much relished by fattening hogs, and is very beneficial to them? I think the fact may be relied on. I am, myself, so well satisfied of it, that mine are kept regularly supplied. The discovery was made here accidentally. The remarkable thriftiness of a large number of those animals confined in a barn-yard, into which was thrown the refuse lime from the trough used for soaking seed wheat, first led to it. The hogs were observed to eat it with avidity. Its usefulness, like that of ashes, often applied to the same purpose, may consist in its being a corrective of acidity. I have frequently, on crossing the Blue Ridge, been struck with the superior condition of the swine in the "Great Valley," and have ascribed it to the abundance of food in that fertile region. May it not be owing, in some degree also, to the healthful tendencies of lime-stone water?

H.

James River, Jan. 14th, 1839.

Newark, N. J., Oct. 10, 1838.

Dear Sir,

I take the liberty to inform you a plan our farmers have discovered in improving their lands, by using stone-lime slacked at the kilns. Our farmers have taken from the kilns here, from 2,000 to 2,500 bushels per day, in the fall and spring, in the time of planting and sowing. The factory here is but a few rods from my house, and is composed of 13 perpetual kilns, and employs 75 hands. I find four other kilns have started this season, in the adjoining towns, for the same purposes, but not as large. The thought struck me, that it would be very good for the land on the James River, and especially your neighborhood. It may be sent out to your farms, and not exceed 12 cents per bushel, at your landing. Should this meet your approbation, you will have the goodness to answer this letter, and give your opinion on the subject.

I am, dear sir,

Your friend and humble serv't,

LEWIS BOSWORTH.

VIEWS OF THE DEMAND, SUPPLY AND PRICES OF THE NEXT CROP OF MORUS MULTICAULIS.

In the last number, we submitted at length our own views upon this subject; and also gave, immediately after, (in the piece signed H. C.) the opposite opinions of one of the most intelligent agricultural writers in New England, Henry Colman, esq., commissioner of the agricultural survey of Massachusetts. We have since seen, in the last number of the 'Silk Culturist,' of Hartford, the following statement of the opinions and anticipations of its editor, Judge Comstock; and it is here copied, that all the light, and the most opposite opinions of those who have the best opportunities of being informed on this subject, may be placed before our readers. No one has had these opportunities more fully offered than the editor of the 'Silk Culturist,' and no editor or writer could be quoted, who stands higher for integrity and sound judgment. But still we consider him as much too sanguine in his expectations of high prices; and as much above the most probable results, as Mr. Colman's calculations were below them. Our position, in this matter, was between these two extremes; and we have had additional reasons, since the publication of the article referred to, to be the more confirmed in the opinions there expressed. It is, however, for our readers to compare, and decide upon, these several views.

It is proper to add here, that what was then stated as *our single postulate* for the sure result of "sufficient prices" for mulberry plants of the next crop, that is, a *bona fide* commencement of silk-culture to sufficient extent—as to Virginia, at least—is made more probable, by every later account received.

No one, even six months ago, could have anticipated the recent occurrences in this strange business and speculation; and we therefore dare not presume much upon the certainty of our present expectations of the future. But whatever may be their degree of correctness, our opinions were weighed carefully, and stated fairly.—ED. FAR. REG.

Extract of a letter from the editor of the Silk Culturist, dated Jan. 1st, 1839:

With these preliminary remarks, I now proceed to give a definite answer to your several enquiries; and, taken together, they appear to involve the general and oft-repeated question, *What will the multicaulis be worth next autumn?* Let us first look at the past. The sales of trees of last year's growth commenced with us in August. The market opened at about twenty cents, though thousands had been sold in Massachusetts and elsewhere for ten cents, and even less. Soon speculation commenced, and they changed hands at different prices, until they commanded $1, and in some cases more, under the hammer of the auctioneer. The last auction sales in New York, were a lot of very small trees, and the prices ranged from 57½ to 70 cents, equal to from 25 to 30 cents a foot, and this, I think, may be safely assumed as their present value at auction. With this brief view of the past, let us now look into the future, and see if we can form any rational opinion of their market value next autumn. However, before embarking upon the ocean of conjecture, I will state one fact, and it is a very important one in my estimation. While in Baltimore, and on my return, I ascertained that purchasers were offering twenty cents for trees deliverable next autumn. One gentleman told me he had contracted for 100,000 at 12½ cents, had been offered twenty cents for a part of them, and had declined the offer. Another very intelligent gentleman, residing in Wilmington, Delaware, told me he had been offered 20 cents for his next year's crop, and had refused the offer. He also mentioned several other instances within his knowledge, of like offers and refusals. From these facts and other corroborating circumstances, I am satisfied that contracts may be made with responsible men in Maryland and Delaware, for the delivery of trees next fall at twenty cents, and probably more. If I am correct in this opinion, it follows, as a matter of course, that the market value of trees of next year's growth, is about the same as it was of last year's growth in August. If this be so, the next inquiry is, will they advance, and if so, to what point? We have seen that they advanced several hundred per cent the last year, in two or three months, and the question is, will they advance in like manner, or at all, during the nine or ten months that must intervene between this time and the time of delivering the next year's crop? and here let me apply my rules of philosophy, and say they unquestionably will, unless the causes which produce the advance the last year, have been removed. But have they? In order to answer this inquiry, we must first ascertain what they were. The causes which occasioned the demand, and the rapid advance, were two-fold: 1st. The small number of trees in the country, compared with the great interest awakened in the culture of silk. The liberal bounties offered by the states of New Jersey, Pennsylvania, &c., for the culture of silk for a limited period, aroused a spirit of enterprise which could be gratified with nothing short of immediate action. Hence large investiments were made, for the purpose of permanent plantations, in the hope of rich returns arising from the profit on growing silk, as well as from the munificience of the government. This was one of the causes and as the laws giving the bounties remain unrepealed, we may confidently conclude, it is not removed in this respect.

But, it is said, the number will be so increased by another crop, and importations, that the country will be fully supplied, the market overstocked, and the price reduced to their actual value for feeding the worm. With respect to the number necessary to supply the country and make every farmer a silk-grower on a very limited scale, I can form no very rational conjecture; but when I look over its vast extent, and take into consideration the number required to plant an acre, I can conceive it to be almost innumerable. Though I am not aware that any calculations have been made on this subject, yet estimates of the actual number now in this country have been made, by different persons, and on different data, but with substantially the same results. All unite in the opinion that the number does not materially vary from 3,000,000. With respect to importations, but little need be said, as it has been ascertained that not more than 100,000 could be procured in all Europe for exportation to this or any other country. It is, however, believed that a few will be imported, possibly enough to swell the number to 3,500,000. Admit this then to be the number on hand for planting the coming spring, and make ten the ratio of increase, which, after deductions for ordinary losses, is certainly large enough, and we shall have 35,000,000; a large number truly, but not enough to supply the little state of Connecticut, a small spot on the map of the United States. The market, therefore, cannot be overstocked, or the price reduced by the increase of the next crop.

2d. Another cause of the last year's demand and price is of the same general character, but developing itself in a different form. Like the other, it originates in the love of money, but is less patient for its gratification. I allude to speculation; for no one conversant with the subject denies the fact, that of all speculations in this country, the mulberry speculation is the greatest. This rage for speculation in mulberry trees is not content with the rich profits which may be realized from their cultivation, but strives to enhance them by buying and selling, like other articles of commerce. So common has this practice already obtained, that it is becoming a custom with editors and publishers of newspapers to give the sales and prices of multicaulis; and the editor of one very respectible daily paper in the city of New York has honored it with a place under his head of "trade and commerce." The fact that estates and even fortunes have been made the past year, not only by cultivating the tree, but by merely buying and selling it, has become too notorious to escape the observation of the eagled-eyed money-maker, and it is not a trait of his character to remain idle while his neighbor is making his thousands and tens of thousands of dollars, by simple stocking an acre of land with the multicaulis. This cause, then, it appears, remains, and consequently I cannot resist the conviction that the effect will continue.

But, in reply to this, it may be said, that the time will come when the country will be supplied, and prices must fall to the intrinsic value of the tree for making silk. True; and so will the time come when this world will be burned up, but where is the farmer who will omit planting his corn and potatoes next spring because that event is certain. The very fact that the time will come when the tree will fall in price, is a sufficient stimulus to men of enterprise and industry to double their diligence in acquiring a competency before it arrives. That period, like all others in the future, is hidden from us, and let us be admonished by its uncertainty, that when it does come, it finds us in a pecuniary point of view, ready. With respect to this all-important time, about which so much has been said, I know but little, having never perplexed myself about it. I consider my time better spent in cultivating mulberry trees, at prices like the present, and thereby laying up something against a rainy day, and endeavoring to persuade my friends to do the same. It is, however, the opinion of the best-informed on the subject, that when that time arrives, I mean, when the country will be fully supplied, you and I shall be at least ten years older than we now are.

Thus much for an answer to the general inquiry, *what will the multicaulis be worth next autumn?* You will perceive, I have given no definite price, nor do I intend to. I have given you a few facts and some arguments, and from them you must draw your own conclusion. I will, however, say, that I think you are within safe limits at the maximum price on which your calculations are based.

* * * * *

I somewhat doubt your being able to procure trees in the spring at the price you mention; but should they cost you 75 cents and multiply tenfold, an investment of $500 would give you 6,660 trees, which, at twenty-five cents, would amount to $1,666, and leave you a profit of over $1000, besides being in the way of profiting by all that they may advance above that price. I certainly am not disposed to hold out encouragement which will ultimately prove fallacious; but I do believe, if you adopt this course the coming spring, the autumn will find you in circumstances more favorable to a relinquishment of the labors of your profession, the purchase of a farm where you can have the privileges of which you speak, and finally, in the enjoyment of that "*otium cum dignitate*," which we all so ardently desire. Respectfully and truly yours, F. G. COMSTOCK.

THE BOHAN UPAS OF THE WEST, A HOAX.

We have been informed by a correspondent residing in the neighborhood of St. Charles, Mo., that the account published in the St. Louis 'Bulletin,' of the enormous *bohan upas* of the west, and cause of the milk-sickness, was simply a specimen of that choice kind of wit called *hoaxing*. Notwithstanding the marvellous features which were so manifest in the article, we had supposed that its being first published in a respectable newspaper, so near the alleged locality of the tree, was a sufficient guaranty that there was something of truth on which to be found the exaggerations of magnitude, &c. Therefore, like most other of our editorial brethren, we were so far deceived as to republish the article, without comment, (page 719 of vol. vi.)

When any journal has thus, unwittingly, aided to give currency to a lie, it is the duty of its conductor, to state the detection. But more especially is this incumbent on the first publisher—and if his exposure is not made (if in his power) of the *deceiver*, as well as of the *deception*, then he is equally guilty of the fraud on the public.—ED. FAR. REG.

MANURING WITH ROTTEN LOGS AND BRUSH.

To the Editor of the Farmers' Register.

Clarksville, February 12th.

Upon the testimony of some of the most respectable and veritable gentleman of Halifax county, Virginia, I shall proceed to give you an account of the remarkable effects of a new and rare manure, as exhibited by an experiment in that county, a few years since. The manure above alluded to, is only rare as to the manner of its application, for in old Virginia it very much aboundeth. The experiment was as follows: A gentleman cut down the pine growth which had covered a piece of land, exhausted and turned out of cultivation by his father or grand-father. As is usual, he suffered the logs and brush to lie upon the land the first summer. In the fall and winter succeeding, he commenced his preparations for a crop of corn, by running two strokes with a large two-horse plough in the same furrow, one turning to the right, and one to the left. This trench thus made, was filled with the logs and brush of the pine trees next convenient to it, which cleared a place for the second furrow; and so on, until this log and brush material was all consumed. With this preparation he passed over half the land. The balance was simply flushed with the same two-horse plough, and well manured from the stable and farm-pen. The crop grown on the beds, manured in the hill with pine logs and brush, was not only the best corn of the two, but was unusually rich in its growth, and heavy in its production. The owner of the corn was induced, from its remarkably luxuriant appearance, to pull up one of the logs, during the growing of the crop, to see how it was that such vigor was imparted to it; he found the countless number of little thread-like roots, which mainly contribute to the supply of the vegetable, to have perforated the water-soaked and partly decayed trunks and limbs of the pine trees, buried below.

Here, Mr. Editor, is a fountain of manure, which, in its general diffusion through our state, and in its practical good effects, as demonstrated above, bids fair to rival the boasted marl-beds of lower Virginia; and that which has been regarded as an indication of poverty and decay in our lands, may be made the instrument of their restoration and recovery.

Your obedient servant,
T. Carrington.

ANSWER TO STRICTURES ON THE PROPAGATION OF SILK-WORMS.

To the Editor of the Farmers' Register.

I have read the strictures of Mr. Layton Y. Atkins, in the January No. of the Farmers' Register, (page 26,) on a paragraph in the second number of my essay on the culture of silk. I readily admit the uncourteousness of the language used by me in the paragraph he refers to, and I can only plead the haste in which that essay was composed, in extenuation. I had no time to revise the article; it was written "off-hand," and went beyond my control before an opportunity was afforded, by reflection, to correct the phraseology. But I cannot go any further than this. The "theory," (I presume he means *the practice*, as I did not give the theory,) I cannot admit to be either "erroneous" or "calculated to do harm." And from a remark in the latter part of his article, I suspect Mr. Atkins has altogether mistaken the meaning of the paragraph he criticizes; for he says, "The energy of the males is far from being exhausted when the females *are satisfied*, and if not taken away," &c. This remark leads me to suppose that Mr. Atkins would allow the moths to remain coupled until the females were "satisfied;" and if so, how does he ascertain that result, if not from the fact of the couple having voluntarily separated? The Chinese writings which Mr. A. quotes, say not a word about separating the *coupled* moths; it merely recommends, "as I understand it," that the males that have become *detached* from the females be removed. The quotation from D'Homergue's essay is entirely irrelevant; and even if ever so much to the point against me, would be no authority with me. My opinion of his essay has long been known, and I need scarcely now repeat it. I will only remark, in passing, that D'H. labored hard to prove that we could *never learn to reel silk without two years' instruction in his filature*, for establishing which, and teaching sixty young men to reel silk, he asked $60,000 of the government of the U. States. His essay is, in fact, nothing more than a compilation from French and Italian works. Will Mr. Atkins do me the favor to say whether he can follow D'H's. direction *to separate the male and female cocoons*, so that they shall be laid on separate tables, "the males on one table, and the females on another?" But I will now give the theory on which my practice is founded, and shall be much obliged if Mr. Atkins will point out wherein it is "erroneous and calculated to do harm."

The silk-worm moth lays from 350 to 400 eggs. Each egg is fecundated separately; consequently, if the moths are separated before they separate of themselves, more or less of the eggs will be unfecundated. There is no precise time required; from six to twelve hours is usually occupied; but I have often known them to remain coupled eighteen hours, and very seldom found them to separate voluntarily in six hours. I have separated them after being together one hour, and but about a dozen eggs were fecundated; those separated at the end of two hours I found laid only about fifty fecundated eggs; and so on in pretty regular proportion to the time occupied, were the eggs fecundated. Those that I separated at the end of six hours were generally about two-thirds fecundated, and very seldom more; while all that I left together till they separated of their own accord, were uniformly *all* fecundated!

Now, in the case of the silk-moths, the French direct that, after they have remained coupled six hours, they must be separated, by taking them by the wings, one between the thumb and finger of each hand, and pulling them apart, and taking the males away. I pray you, Mr. Editor, to look at this direction with a little of your usual common sense, and say whether I have been unpardonably "uncourteous" in calling this "foolery?" I leave out the national allusion in courtesy to Mr. Atkins. Is there any other instance in the breeding of animals in which this act is thus interfered with? Is there a single reason that can be given for such interference?

I do not object to removing the males from the females, after they have voluntarily separated; on the contrary, I have my fixtures so contrived, that the *released* males generally fall off upon the floor and are swept out of the room.

The "viscid humor," spoken of by D'Homergue, is nothing more than the remains of the contents of the *ovarium* after the eggs have been formed; it is often entirely absent, and I never knew it to do any other harm than to soil the papers on which the eggs were laid.

Gideon B. Smith.

[The views on both sides of this matter have now, we presume, been sufficiently expressed, and we beg leave to close the discussion. It would be a ridiculous degree of squeamishness to exclude such subjects from an agricultural journal, which must necessarily treat of many particulars of the generation and propagation, of domestic animals. But it is nevertheless desirable that the language used, on such anatomical and physiological branches of general agricultural science, shall be as much guarded in manner, and limited in extent, as utility may admit, and propriety require.—Ed. F. R.

From the Southern Agriculturist.

LARGE AMOUNT OF SOAP PRODUCED FROM MYRTLE WAX.

Mr. Editor,—Many of your readers may not be aware of the great quantity of soap which can be produced from a small quantity of myrtle wax. I have repeatedly made the experiment in my own family; and in hopes of being useful, I send you the following account, taken many years since, and which has been found correct up to the present time.

To three bushels and a half of common wood ashes, was added half a bushel of unslacked lime. These being well mixed together, were put into a cask capable of containing sixty gallons, and was filled up with water. In forty-eight hours, the lye was strong enough to float an egg. It was then drawn off, and from six to eight gallons of it put into a copper kettle, capable of containing about twenty-five gallons. To this was added only *four pounds* of myrtle wax. This was kept boiling over a constant steady fire from 9 o'clock in the morning till 3 in the afternoon. For the first three or four hours, a supply of strong lye was poured in occasionally, and the whole frequently well stirred with a ladle. After six hours boiling, two quarts of common large grain salt were thrown into the kettle, which was left one hour more to simmer over a slow fire. The liquor was then put into tubs to cool, where it continued twenty-four hours; and then the soap was taken out, wiped clean, and put to dry. The next day it was weighed, when the produce was found to be *forty-nine pounds* of good solid soap, from the materials, and by the process above mentioned. At the end of six weeks, the soap had lost only a few pounds, from the evaporation of its watery particles.

In many parts of our state, the myrtle tree is abundant, and from three pecks to a bushel may be gathered from a hand per day. Would it not be worth the while of our planters to attend to this matter? I am sure it would save them many a dollar. Your obedient servant,

ECONOMY.

St. Paul's Parish.

From the Horticultural Journal.

EMASCULATION OF THE VINE, OR A METHOD TO PRODUCE GRAPES WITHOUT SEEDS.

Some of your readers will possibly feel startled at the above designation, and many will disapprove of a term used in surgery to an operation on the vine, at variance with received opinions on the physiology of plants. But to your more ingenious readers, the experiment will offer a new source of amusement, and perhaps may lead to useful investigation. In Portugal and other places, I frequently met with orange and lemon trees, which produced fruit divested of pips. Upon inquiring for the cause, no one was able to enlighten me, further than that the effect was accidental. And I make no doubt that mere accident, (such as the perforation of the plant, when young by a worm, or a blow from a spade or hoe, when first planted,) did produce the same effect on those trees which it would have produced upon the vine, if done purposely, and with a view of the same result.

For this ingenious operation on the vine, I was indebted, some years ago, to a horticulturist of great eminence in Paris. It is as follows:

When the sap is rising in March, make a deep incision in the heart of the bearing branch, from whence extract, with a grafting knife, about a quarter of an inch [1 centime, 5 lignes,] of the pith, [moelle,] close under the first bud [nœud,] at the stem, (souche.) The wound is then to be bound up with worsted, like a graft. This may be removed at the end of three weeks.

If the operation be performed with care, after some experience, the result will be the production of grapes without pips.

From the Horticultural Journal.

NEW METHOD OF APPYING SULPHUR TO PLANTS, IN A LIQUID FORM.

The "flowers," or the finely levigated stone brimstone, are with great difficulty mixed with water; and yet it is sometimes highly desirable to throw a shower of sulphuretted water over the entire foliage of a vine or peach tree. This object can be readily effected by the aid of a little gum tragacanth [gum-dragon, as it is vulgarly called.] Half an ounce of the *powdered* gum, which can be procured very cheaply of any druggist, may perhaps suffice for two or three years. To a table spoonful or two of flowers of sulphur, in a wedgewood mortar, add three or four grains [or a quantity that would scarcely cover one half of a four penny piece,] of the tragacanth; rub them together, dropping in a very little water; work these materials with the pestle till an even pasty mass be produced; then add water, to bring the sulphur to the consistency of cream; and in this state it will unite with any quantity of water: or, in other words, the particles of the sulphur will become diffused throughout the whole bulk, and can then be taken up by a syringe. The sulphur, it is true, will be deposited in time, but agitation will bring it again to that state of diffusion in which the particles may be thrown on the plant; to which, also, they remain *fixed* in situations wherein they may exert their utmost energy, whether that be preventive or remedial.

THE FORMER POOR AND EXHAUSTED CONDITION, AND EARLIEST SUBSEQUENT IMPROVEMENTS, BY MARLING, OF COGGIN'S POINT FARM.

(An omitted portion of the 'Essay on Calcareous Manures.')

[The following article was, as it purports, for the greater part, written in 1826, and was added to and completed in 1833. The object of it, at both times, was to be inserted in the 'Essay on Calcareous Manures,' to serve as appendix to the many particular experiments with marl, therein given. But the same considerations, as stated below, which prevented it's being included in the first edition, also operated to exclude it from the second. In now giving it publication, no change has been made, except a few merely verbal corrections.]

Experiments on a small scale, made to test the value of manures, however numerous and varied they may be, or however carefully conducted and minutely reported, will never be so satisfactory to the reader, as knowing the general effects of the same practice when applied to the whole of the experimenter's land, and affecting the whole of his capital and labor. In limited experiments, the operator may easily deceive others, if he chooses: and, even if actuated by the strictest regard for truth, the wish to obtain a particular result, will often cause him to deceive himself. But in the results of any general practice, continued for ten or twelve years on a well known farm, it is impossible that the cultivator can deceive either himself or his neighbors. For this reason, those who have read the statements of the experiments presented in this essay, may require to know what proportion the success of my subsequent and general practice bore to their results. The personal objections which caused me to exclude the following detailed answer to this requisition from the first publication of this essay, are not removed. But it has appeared that the omission has caused distant readers to place an estimate on the writer's merit and general success as a farmer, far above the truth—and many others may err as much by measuring the value of the system of *improvement* recommended, by the known and acknowledged faults of the writer's general management. Either of these inferences would be erroneous, and, in different ways, would operate to impair the value of the opinions and facts which have been presented to the reader. These considerations induce me now to submit the details which will follow, of matters which, in any other aspect, are of no importance to any but myself. The objectionable character of egotism is necessarily conspicuous in these details; but that fault cannot be possibly avoided in a work which is, in fact, but a statement of the opinions, experience, and personal labors of the writer.

Having kept written memoranda of my farming operations as long as they engaged my personal attention, I am enabled to present a table of crops, which shows the grain crops of Coggin's Point, from 1813 to this time, 1826,* with as much accuracy as can be expected under such circumstances. This would be the best of all modes of fixing the general effects of any system of improvement, if the fields, and the rotation, had remained without alteration. But, like most others in our country, my farm has been in a state of continual change in these respects, which prevents as accurate conclusions being drawn, as other circumstances would have allowed. From 1813 to 1826, the arable land (excluding all waste spaces, not cultivated,) has been increased from 472 acres, to 602, by clearing wood-land, and some draining. The rotation has been changed from 3 to 4 shifts, and still is not regular, as the poorest land is sometimes left out when it comes in turn for corn, (so as to have three years of rest, and bear only one crop of grain)—and the richest land is sometimes made to bear three, and, in some rare cases, even four grain crops in succession. Still, however, some of the facts are not affected by any such sources of error, and will serve to show the miserably low product of what was called, (in common parlance) "a good James River plantation;" and from which may be inferred something like the usual product, of the back lands generally, which were so much inferior to those on the river—and which still remain as poor as ever, where no marl has been used.

Of the 472 acres of arable land, about 100, on the river, consisted of *neutral soil*, including a much smaller proportion of what was *calcareous*. All this had been very much reduced below its great original fertility, by severe and careless tillage, and still more by the washing of rains. The produce of this once fine soil was still equal to 20 bushels of corn, (and in some cases 25 or more,) on the richest places, which were too level for the soil to be washed away by rains; and as low as 15 bushels or less, on a larger proportion. This kind of land, (though generally a light loam, and none of it clay,) formed the only good wheat soil on the farm. It did not form one body—but was cut up and separated into many pieces, by hill-sides, ravines, and strips of wood, marsh, or other waste or worthless land. The same objectionable surface and form belong to nearly all the old cleared land on the farm; a large proportion being hilly, and more or less injured by washing—and many deep natural ravines with wet bottoms, which were covered with trees, serving to kill the land all along their margins, to shelter vermin, and greatly to increase the labors of every year. Nearly 300 acres, which lay next to the neutral and calcareous soils, were of the land penetrated by these ravines; and all this was supposed to have been originally of that kind of soil called *free-light land*, though not as light, except a small portion, as the soils described in experiment 14 [pp. 46, 47, of 2nd ed. 'Essay on Calcareous Manures.'] The remaining 70 to 90 acres were outside of the heads of the ravines, and like the adjacent wood-land, must have been always unproductive, as well as *acid soils*. The greater part of the land added by clearing afterwards was of the same bad character; and not so much as 20 acres of new land was of durable fertility. Nearly all the inferior qualities of soil were *acid sandy loam*—though a small proportion was of *acid clay*.

This general description of soils, and their situation, if considered in connexion with my doctrines as to the action of calcareous manures, are enough to prove that the farm was not favorably constituted to be highly benefited by those manures. Their greatest effects have always been on the most acid soil. The great body of the old cleared land, showed less benefit, even where level, and still less in proportion as its natural soil had been lost by washing. As to the spots so much washed as to be barren "galls," the worst of them still remain in that state, and never can be made productive, except at a cost exceeding their value after being improved. The neutral soil has been still less improved by marling. In addition, the excessively heavy applications of marl on more than 150 acres, caused the benefit of that manure to be almost lost for some years, and the whole damage has not yet been overcome.

The crops of corn have not been actually measured by the barrel, except in those cases marked [thus *] in the table. In the other cases, estimates of quantity were made by the cubic contents of the houses filled with corn, or by the number and average size of the cart-loads brought from the field. After the first five corn crops, neither their amount, nor average to the acre, indicates the rate of improvement, for several reasons: the usual extent of cultivation was much lessened for some years, to furnish labor for marling, and at other times on account of the low price of corn,

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* The time when this was written. I have thought it best not to change its form, but to add the observations afterwards, that my experience has furnished, from 1826 to this time, 1834.

(sometimes it being less than 40 cents the bushel,) and there being on hand a large supply. The parts thus left out were generally the poorest of the field, which had the effect of raising the apparent average product. From 1818 to 1823, inclusive, the crops of corn were also considerably increased by the annual cultivation of part or all of 30 acres of embanked tide-marsh, which has since sunk so low as to be unfit for grain, or even grass. But the average product of wheat is a much better measure of the rate of improvement of the farm: for though the sandy nature of most of the soil was very unfavorable to the growth of wheat—yet having a ready market, and the delivery at my landing, and being able to deliver it very early, it was deemed the most profitable crop, and as much was raised every year as the system of cultivation and extent of land permitted. The whole crop was always delivered to the buyer within the space of two or three days, which leaves very little ground for error in quantities. My fields have been carefully surveyed, and the only mis-statement, on that score, that the following table can present, will arise from my having to guess at the sizes and amount of the pieces of waste land included in the fields, but deducted in the statement of acres cultivated.

TABLE OF GRAIN CROPS.

Year.	Acres in wheat.	Product in bushels.	Average per acre.	Average crop.	Average per acre.	Acres in corn.	Product in bushels.	Average per acre.	Acres in cotton.	Acres marled.	Remarks.
1813	145	810	$5\frac{85}{145}$	627	$5\frac{2}{3}$	125	2250*	18			* Measured.
1814	110	550	5			163	1340*	$8\frac{36}{163}$			
1815	78	520	$6\frac{52}{78}$			136	1955*	$14\frac{51}{136}$			
1816	104	896	$8\frac{64}{104}$	647	$7\frac{11}{12}$	144	2300*	16			
1817	79	595	$7\frac{42}{79}$			188	2050*	$10\frac{170}{188}$			
1818	63	450	$7\frac{9}{63}$			160	2670	$16\frac{110}{160}$		15	First commencement of marling.
1819	132	1015	$7\frac{91}{132}$	1028	$7\frac{1}{2}$	137	2000	$14\frac{82}{137}$		62	Very thin marling as yet.
1820	119	1020	$8\frac{68}{119}$			164	2780	17		25	
1821	160	1049	$6\frac{89}{160}$			77	1775*	23		80	
1822	154	1627	$10\frac{87}{154}$	1651	$10\frac{1}{6}$	114	2250	$19\frac{84}{114}$		93	
1823	139	1475	$10\frac{85}{139}$			158	3000	19		100	
1824	194	1850	$9\frac{104}{194}$			156	3405	$21\frac{4}{5}$		80	Marling nearly extended over all the cleared arable land requiring it.
1825	195	1452	$7\frac{87}{195}$	1403	$8\frac{1}{6}$	70	1254*	$17\frac{64}{70}$	48	50	
1826	170	1390	$8\frac{3}{17}$			138	2275	$16\frac{67}{138}$	70	24	
1827	151	1366	$9\frac{7}{151}$			104	1665	16	$76\frac{1}{2}$	27	

Imperfect as this table is, for the various reasons before stated, it furnishes information in some cases so exact, that they deserve to be considered as accurate experiments on a whole field, or the entire farm. The most important of these cases will be referred to, and accompanied with such explanations as are necessary.

The first three crops of corn covered all the land then cleared, except 48 acres, which could not have yielded more than 10 bushels per acre. That supposed product being added to the actual product of all the balance, (forming the crops of 1813, 14, and 15,) shows the average of the whole cultivated land (excluding all waste spaces,) to have been 12¾ bushels the acre. From such an average on land of very unequal qualities, there can be no doubt but that the poorer half of the farm did not yield on the average 8 bushels of corn. During the first 6 years, but little of this poorer half was sown in wheat, as it would not have yielded more than 2 or 2½ bushels: Therefore, the first two general averages of 5⅔ and 7$\frac{11}{12}$ bushels of wheat, were obtained from the richest parts (say three-fifths) of the land; and if all had been included, a much lower general average would have been made—probably not 4 bushels. The increase of general average product of wheat, per acre, in the second of these two terms of three years, was not owing to any appreciable increase of fertility, but to the circumstance that much less land was sown, and the parts left out, of course, were the poorest. The wheat crops of 1819 and the next two years were increased in amount by a summer fallow of some of the poor lands before left out—besides the improvement which had then been gained from the earliest marlings. Since then, all the poorest land has been marled, and *the whole* is regularly sown in wheat in its turn; and yet the average of the years 1822, '23, '24, rose to 10⅙ bushels. Afterwards the crops, as well as the average products were reduced—but it was owing to various disasters which greatly injured all the crops of our part of the country. In 1825 very few persons made half a crop; and still less of perfect grain.

No grazing had been permitted on the poor land, and but little on the rich, since 1814—and during the first 6 years, before marling was begun, I was more attentive to making and applying farm-yard and stable manures, than for the 6 or 7 years after. The table shows that these means produced very little, if any, general increase of crops—and that nearly all the improvement actually gained was apparent *as soon as marled land only was sown in wheat.* As each field came under its second rotation, there was always more or less of loss sustained from the disease caused by my improper heavy dressings.

One circumstance should be stated, as it served to make the apparent average increase of crops greater than the truth—and another, that served to lessen it. In 1824, '25, and '26, a field of 70 acres of the best soil was one half in wheat on fallow every year—which gave a crop from 35 acres each year, instead of from only half that amount, which would have been from the regular four-shift rotation. The other circumstance was the clearing and bringing into cultivation more than 100 acres of land, which, before marling, would certainly not have averaged 6 bushels of wheat to the acre; and of course this served to lessen apparently the general average, after it was raised to 10 bushels. The reclaimed marsh, before referred to, never bore wheat, and therefore has not affected these estimates.

The product of one poor field of 135 arable acres happened to be measured and set down separately, for two crops of corn, before marling. In 1814, it brought 1125 bushels, or 8½ to the acre. In 1817, with the advantage of a good season, it brought 1235 bushels, or 9 and a small fraction to the acre. In 1825 my whole crop was on 70 acres of this field, (supposed to be a fair average of the whole,) and the first cultivation after its being marled. The produce was 1254 bushels, very nearly 18 bushels the acre. Some farm-yard manure had been given to this crop—and rather more to each of the two former. But no manure put on that land, before marling, had shown any effect longer than a single course of crops, if so long.

Since this table was prepared, and the foregoing estimates and observations written, (to 1826,) 8 more crops have been made. Not having paid the same personal attention to my business for the greater part of this time, nor continued to make written memoranda of the operations of the farm, I cannot extend the table of crops accurately to this time, and can only state general and important results.

The wheat crops of 1827, 28, 29, as well as the two last preceding those years, were all very bad, and generally on account of *rust*, which seemed to have become so regular and destructive in its visitations, that I began to think that a change of climate had taken place, which required that wheat should be abandoned as a crop in lower Virginia. Most persons, on poor land, between James River and Carolina, gave up the crop entirely. My own sowing was on this account reduced in extent by 30 or 40 acres a year, of the richest land, which was given up to the then newly adopted crop of cotton. This crop was commenced on 48 acres in 1825, increased to 96 by 1829, was reduced greatly in extent in 1830, and then abandoned *for ever.* My crops of cotton were very good, and peculiar benefits were obtained from the powers of marl in warming the soil, and hastening the maturing of the crop. But my best land, wherever it might lie, was taken for cotton—and all my farm-yard and stable manure was given to it. The land being kept year after year in that crop, and under the most perfect and incessant tillage, was caused to be washed most destructively by every heavy rain; so that, with washing and exhaustion together, all the manure did not prevent the best land being actually reduced in productiveness in these five years. This culture had also cut up and almost destroyed the best fields for other crops; and not only took their best portions for cotton, but also robbed the other and poorer parts of all share of the manure. It is therefore not to be wondered at, that the wheat crops should have been much diminished, even without the aid of so many successive bad seasons. In 1831, the crop of wheat generally was remarkably good; and of mine, 2401 bushels were measured, and fully one hundred more had been lost by sprouting in the field during the longest spell of wet weather, about the close of harvest, ever before known at that time of year. In 1835, the crop of corn, on one of the four regular shifts, amounted to more than 4000 bushels. At this time, (1834) the arable land has been increased to about 770 acres, by new clearings of wood-land, all of which was of acid poor soil, the first cultivation of which, even after marling, served to reduce the previous general average product of wheat. Clover, which the cotton-culture excluded from the best soil, has since been sown over nearly the whole farm, and grows on every field, with more or less vigor, according to the condition of the land. This has been partially grazed, and the best parts mowed for the last few years. Farm-yard and other putrescent manures, which were almost entirely neglected while the marling was most on hand, have since been collected and applied much more abundantly, than at any former time, though still less so than ought to be done. With the operation of all these circumstances, there were others which served to have counteracting effects. The withdrawal of my personal attention from my farm, (owing, at first, to long-continued ill health,) the removal to another place of residence—and the change of pursuits, and of habits growing out of these and other circumstances—all concurred to change a general system of farm-management, which had been always imperfect, slovenly, and wasteful, to what was much worse in every respect. It is, therefore, not strange, that improvement has not kept on with the rapidity with which it formerly advanced, notwithstanding the many causes which operated even then, to retard its progress. Whatever I have been enabled to perform by the only means for improvement, in which zeal and the deep interest felt, made me highly successful, may be done much better, and with much greater profit, by the many who are better economists and better operatives; or by many others, who, though perhaps exercising no more skill and economy, have greater facilities for applying calcareous manures, and soils more favorable to receive such improvement. It is believed that the present average product (1834) of the arable land of the Coggins' Point farm, (excluding all waste spots) in corn, would be from 20 to 25 bushels to the acre, in average seasons, and with good cultivation—and in wheat after corn, 9 to 10 bushels. Wheat on clover, of course would be far more productive, but to what extent, I will not presume to offer an estimate, as this system is but now commencing as a part of the general rotation.

POSTSCRIPT.

Petersburg, February, 1839.

It would probably appear a strange omission if nothing were added to the foregoing statement, of the four years which have since passed. It is, therefore, that a few general remarks will be offered. Long before the date of the last additions, (1834) the writer had not only changed his residence, but had undertaken other pursuits which have since become more and more engrossing in the demand on his time and labor, and have prevented all personal attention to his farming business. Added to this, the laboring force on the land was, at first, inadequate to keep it in proper state, either of tillage or of continued improvement; and the annual increase of fertility since, has served to increase the need for labor, and the losses incurred by the deficient labor and other farm capital not being supplied. Thus, while the progressive improvement of the soil and the increased ability to reward proper exertions, are abundantly manifest, the farm, in every other respect, was suffered to get wretchedly out of order; and now requires much labor and expense to be put in good condition. The requisite labor has just now been furnished, and other remedies afforded; and it is hoped, that within a few years time, the great and valuable improvement made here by marl, will no longer be partially obscured, or the full effect of it be rendered the least doubtful, by the mismanagement of the farm, or neglect of its owner.

ED. RUFFIN.

From the Cultivator.

ROOT CULTURE.

Persuaded that root culture is ultimately to effect a great improvement in our husbandry, we propose to make it the subject of some remarks in this and subsequent numbers. The advantages which root crops offer to the farmer, are the following, viz: they furnish the most food for animals, and the most food for vegetables in the form of dung; they are least exhausting to the soil, which they serve to divide and pulverize; they are excellent to alternate with grass and grain in convertible husbandry; and for these reasons they are the most profitable to the cultivator, on all farms which will admit of their culture. We intend to direct the attention of the reader to the different roots which are adapted to our field culture, to the best modes of managing the crops, the manner of preserving and feeding them properly, the expense of culture, the average product, and, so far as our data will justify, state their relative value as cattle food.

The roots we intend to notice are, the potato, the turnip, the beet, the carrot, and the parsnip. But before we proceed to consider them individually, we will offer some preliminary remarks.

Five things are essential in the culture of the roots we have named: 1st. A dry soil; 2d. a rich soil; 3d. a deep worked soil; 4th. a well pulverized soil, and 5th. good after-culture. The crop will be abundant in proportion as these several requisites are present, and defective in proportion as they fail.

By a *dry* soil, we mean a soil that is not wet. *Moisture* is beneficial to all crops, but *water* is detrimental to all root-crops, though it repose upon the sub-soil, or but occasionally saturate the surface. Hence where roots are grown upon soils that are tenacious and flat, or upon those which repose upon an impervious sub-soil, the land should be thrown into ridges, and the furrows kept open for the free passage of the water in heavy rains.

A rich soil is as essential to good crops as rich and abundant food is to the fattening of farm stock. We all know that short pasture and coarse fodder will *keep* cattle, though it will not *fatten* them. So with roots—they will *live* and *grow* upon a poor soil, but their product and profit will be great only on a *rich* one. The advantage to the crop, as well as the animal, will be in proportion to the quantity of dead organic matter which it converts into living organic matter—into vegetable and into meat. Ordinarily speaking, a good dressing of manure will double the products of a root-crop. To illustrate this fact more fully, we abstract the following tabular statement from Arthur Young's experiments in planting potatoes. The preparation and culture were alike in all. The numbers to which the asterisk [*] is affixed were manured crops.

No.	Preceding crops.	Expense			Product, bushels.			Profit.			Loss.	
		£	s.	d.				£	s.	d.	s.	d.
1	Fallow,..	3	19	1	104	at 1s.	6d	2	18	5	0	0
2	Barley,...	4	5	9	128	2	0	3	11	10	0	0
3	Wheat,..	6	13	6	46	0	20	0	0	0	0	0
4*	Do....	7	16	10	101	0	20	2	5	6	0	0
5	Do....	6	2	6	39	0	20	0	7	6	0	0
6	Do....	7	19	4	63	0	20	0	16	11	0	0
7*	Do...	4	14	5	170	0	20	9	2	0	0	0
8	Do....	8	9	3	30	0	20	0	0	0	15	6
9*	Do....	4	12	1	201	0	20	11	2	9	0	0

The three manured crops, it will be seen, gave an aggregate product of 472 bushels, and an aggregate net profit of £22. 10. 3, [$99 90, say $100;] the three adjoining plants, treated like the others in all respects but manuring, gave an aggregate net product of but 132 bushels, and an aggregate net profit of but 8s. 11d. [$1 96, say $2;] thus showing that the manure, in these cases, caused an absolute gain of $98, and that where it was not used, there was in fact only a nominal profit of *two dollars.* These facts will serve to show the reader, *first,* the great value of manure in farming operations, and to stimulate him to save and economise it; and, *secondly,* to show him the propriety of *always* manuring his potato crop, for which it is universally admitted the unfermented dung and litter of his cattle yard is *best* fitted.

A deep worked soil is necessary, that the tap roots of the beet, carrot and parsnip may not only penetrate freely, and enlarge their length and volume, but that their radicles, which are principally upon their lower extremities, may there find food for the plant. The fibrous roots of the potato and the turnip are equally benefitted by a deep tilth, from which they can draw nourishment, and find shelter from drought.

The pulverization of the soil is essential to the germination of the seed, to the easy extension of the roots, and to the free circulation of air and moisture, and the admission of solar heat, all necessary to prepare and transmit the food to the growing plants.

Thinning the plants and keeping them free from weeds, and the surface of the soil open to atmospheric influence, is of great importance. If the soil is dry, and rich, and deep, and well pulverized, the labors of the husbandman will yet not avail much, in root crops, if he suffers his plants to be injudiciously crowded, or to be choked and robbed of their food by rank growing weeds. And as prevention is better than cure, the thinning and cleaning processes should be commenced early, and rigidly persevered in, not only that the weeds may not exhaust the fertility of the soil, but that the latter growth may not mature their seed, and thus perpetuate the evil.

In our next number, we shall treat of the culture, &c. of the root crops named in the commencement of this article.

From the Cultivator.

EXPERIMENT IN PLANTING CORN—ALTERNATION OF CROPS—MODE OF APPLYING GYPSUM—OF FATTENING HOGS.

Rockingham county, Va. Dec. 25, 1838.

SIR—A friend of mine, last spring, planted a part of his corn at the depth that corn is usually planted in this part of the country, and in another part of his field, he ran his planting furrows unusually deep. The land was of uniform quality, and the corn in both parts covered with the common quantity of earth, so that the only difference in planting, consisted in the different depths of the planting furrows. In the early part of the summer, the corn planted in the shallow furrows, grew the best, and promised to make the best crop, but in the latter part of the summer, the season became dry, [the drought was severe,] and then the shallow planted corn began to wither, whilst the deep planted corn kept green, and continued to grow after the other was almost killed by drought, and made in the end greatly more corn. These facts have brought to my attention the question, whether corn should be planted deep or shallow? And by the question, let it be understood, that it is not a question about the depth of earth with which corn shall be covered; but a question about the depth of the furrow. And to this question, I would invite the attention of agriculturists, and request the communication of facts from all who have had any experience in the two modes of planting; as it is by a comparison of many facts only, that we can come to any safe conclusion in agricultural affairs. I have understood, that it is settled, that in the sandy lands and warm climate of South Carolina, deep planting is best. And if it shall be found that in our more northern climates and clayey soils, deep planting will yield the best crop, there is another advantage attending it, that will recommend it to those who cultivate this valuable grain. Corn that is planted deep is not so easily blown down by winds, and will not be bent and tangled at cutting time, like that which is planted on the surface. As this is a question involving no depth of reasoning or scientific knowledge, it may perhaps be passed over, with less attention than it deserves. But if it be duly considered, it will be found to be a question of interest, and it is hoped that all who can communicate facts will contribute their aid to a correct settlement of the question. In the case mentioned above, the corn was planted in a sandy soil, of but moderate fertility, and it will occur to all that in experiments which may be detailed, the character of the soil should be given.

Another question of interest to myself, is now forcing itself upon my attention; and I would be glad to hear the opinions of those, whose experience may enable them to speak upon the subject. To state the question more clearly, I will premise that for near twenty years, I have been cultivating a small farm upon the four-field system. When it first came to my hands, a part of it, though originally fertile, had been greatly exhausted by bad management, and all my efforts were directed to its improvement. My crops have been corn, wheat, clover; and by a free use of plaster and some degree of economy in saving manure, my farm is now greatly improved and may be said to be in good heart. The soil is a tolerably stiff clay, based upon what we call blue slate, the rock lying at a good depth below the surface. I have preferred mowing to grazing, and as the hoof is injurious to clay lands, the stock have been kept off the fields as much as possible, when the ground was soft. But little has been sold off the farm except wheat, clover seed, cattle and hogs.

Having but a small farm, and being desirous of cultivating more land than my farm will allow, upon the four-field system, I am inclined to divide my land into three shifts, and this forces upon my attention the question, whether I can preserve the degree of fertility which my land has attained, by cultivating corn, wheat, and clover, and letting the clover stand but one year, instead of two. By letting the clover stand two years, the land has improved; and now if it shall stand but one, will the land deteriorate, and will the crop be reduced? Let it be supposed that the corn shall be fed upon the farm; that the clover shall be in part mown, and in part grazed by hogs; and that a reasonable degree of economy shall be used in saving manure.

As he who asks information from others, should be willing to communicate any which he may have, and thereby show his readiness to contribute to the common fund, I will mention, that my practice, has been to sow plaster broad-cast upon corn, instead of putting it on the hill, believing, that at earing time, which is the most important, the roots have spread over the whole surface, and that the plaster being sown broad-cast, will then be in a situation to contribute more to the growth of the corn, than it would be if placed immediately at the stock, as it is the ends of the roots that take up nourishment: and believing, too, that when sown in this way, the plaster will benefit the succeeding wheat crop, and the young clover which shall be growing with the wheat. I have indeed thought, that sometimes the young clover is thereby saved from being killed by drought.

For some years past, my attention has been turned to hogs, and having been successful in my efforts, I will give you my opinions upon that subject. The more common practice with us, is to let our hogs shift for themselves, or to feed them but sparingly the greater part of the year, and then during the fattening season to feed them to excess. We then attempt to do that by force, which might previously have been accomplished by an easier and cheaper process. By feeding too sparingly during the winter, the hogs are kept alive only; they do not grow; become stinted, are worth no more in the spring than they were in the fall, frequently not so much, and of course what has been fed has been wasted; and then, during fattening season, they are fed to excess, and loss is sustained by undigested corn. My plan has been to feed well, to start my pigs fat, and to keep them in uniformly good condition. They are always growing and increasing in value; are fed with a small quantity of grain when running in clover pasture, and by cutting up corn for them as soon as it is in good roasting ears, they are ready for market, as soon as the weather is cold enough for slaughtering. They are, in this way, fattened during moderate weather, and all agree that hogs fatten faster in moderate than in cold weather. I prefer fattening in a field, to a close pen, and from my observation, I am satisfied the field is the best. The field is used that is intended for the corn the following year. The grass and clover roots which they get, contribute to their health, and save corn, as any one may be convinced, by observing that they will feed a part of the day on the clover, however plentifully they may be fed with corn. If hogs be well fed, and kept *dry*, and *clean*, and *warm* in winter, and be furnished with shade and plenty of water in summer, they will, I think, be always profitable. A good breed should be selected, as some breeds are certainly more profitable than others. The feeding of hogs presents another question of interest, and we ought to inquire, whether clover grazed by hogs, will improve the land as much as if it be grazed by cattle; and whether the corn fed to hogs upon a field will improve it as much as if it were fed to cattle. These are questions which I would not undertake to decide from my experience, and upon which I would like to hear the opinions of others. If these inquiries shall receive any attention from the correspondents and readers of the Cultivator, I may be encouraged to trespass again upon your attention. GEORGE H. CHRISMAN.

From the (London) Farmers' Magazine.

ESSAY UPON THE BREEDING OF LIVE STOCK, AND ON THE COMPARATIVE INFLUENCE OF THE MALE AND FEMALE PARENTS IN IMPRESSING THE OFFSPRING.

By John Boswell, Esq. of Balmuto and Kingcausie.

[In the year 1825, the Highland Society proposed as the subject of prize essays, the solution of the question, "Whether the breed of live stock connected with agriculture be susceptible of the greatest improvement, from the qualities conspicuous in the male, or from those conspicuous in the female parent?" Four essays were received, to which premiums were awarded. Those that were written by J. Boswell, esq. of Balmuto, and by the late Rev. Mr. Berry, were considered the best. As many persons may not have seen these essays, which contain information valuable to all those who study the principles of breeding, we have given the essay by Mr. Boswell, which will be found interesting to every one concerned in the breeding of stock.]

> Te quoque, magna Pales, et te memorande canemus
> Pastor ab Amphryso.—VIRGIL.

The very great utility of a clear knowledge as to the best method of improving the breed of live stock, connected with agriculture, must be apparent to all; and as one heartily devoted to agriculture in all its branches, I cannot help congratulating the farmer on the information he is likely to receive on so important a subject through the endeavors of the Highland Society. As this subject has long [I may say from my earliest youth] been one in which I have taken the greatest delight, and on which I have bestowed much thought, besides having had very great opportunities of seeing experimentally the changes produced on stock from crossing, and other circumstances, I trust I may be justified from any charge of self-assurance, in offering a few facts in as short and succinct a manner as the nature of the subject and my own experience as an author, will permit, being well aware that facility of communicating knowledge is almost as necessary as experience in order to shine as an essayest.

Hoping, then, for candor in weighing the various facts I shall bring forward, and deprecating criticism as to the manner in which they are brought together (being a mere farmer, and no author,) I shall lay before the society such as occur to my recollection.

The society has put the question, "Whether the breed of live stock, connected with agriculture, be susceptible of the greatest improvement from the qualities conspicuous in the male, or those conspicuous in the female parent?"

The first thing to be done is to answer the query put by the society, and, having done so, to prove by facts that the answer given is the proper one. I have not the slightest doubt in my own mind that the answer ought to be "the male."* But before proceeding to prove this, I would warn all who may turn their thoughts to the subject, that it must be an enlarged view of this or any other matter connected with nature, which alone can give a true knowledge as to the point at issue. The fable of the fly on the building ought never to be forgetten; and the stock of a country or a district can only lead to the true result as to any particular breed. I would also remark, that, before the breed of a country can be improved, much more must be looked to than the answer to the question put by the Highland Society, such as crossing, selection of both parents, attention to pedigree, and lastly, food and care of the offspring.

I shall endeavor to explain my ideas on these heads; and then, having given some proofs as to the male being the parent having the greatest influence on the progeny, I shall endeavor to prove, that, whether I be right or wrong, still the male is the parent which we must look to, as best calculated to improve the breed of any country.

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* It often happens that an author who has distinctly espoused one side in a question so difficult as this, feels disposed, after the lapse of two or three years, to modify, or even alter, his opinions; but it is consistent with our knowledge, that the accurate observations and farther experience of two years have only strengthened the author of this essay in the assertions which it contains.—ED. FAR. MAG.

The art of improving the breeds of different animals was almost, if not altogether, unknown to the ancients. Virgil, who seems to have paid some attention to it, has stated things which experience has since taught us are erroneous. In this part of the island it has yet to be introduced, and we are forced to go to England for authorities on the subject. A few of our countrymen have indeed, of late years, come fourth, as it were —and in this number we must rank Mr. Stirling of Keir, Mr. Robinson of Ladykirk, and Mr. Rennie, jr. of Phantassie, who having seen the value of improved stock, and of attending to pedigree, or breeding from parents, "*de bonnè race*," as the French well express it: but with the exception of these, and some few others, we are yet miserably behind. The very term "a great breeder," signifies two totally different things in England and Scotland: in the former, it means a judge, and one who delights in improved breeds; in the latter, a person who has a great number of (commonly speaking) half-starved calves or miserable lambs, and in whose stock we may see every variety of shape and color. We have only to look to any drove of Scotch beasts on the road, to satisfy ourselves of the want of all care in our breeders. The cattle are of all different shapes, some with horns, and some without; and if you inquire of the owner, you will find that he purchased some of those dissimilar beasts, not from different breeders, not in different districts, but from the *same farmer*—and his own cattle in one fair. How and why is this? Because our Scotch farmer is ignorant of his own trade! They all know and admit, that "breeding-in-and-in," or "oure sib,"* as they call it, is bad; they know the value of crossing, and they wish to cross, and do so; but it is without judgment. A farmer no sooner hears that his neighbor has got a good bull, most likely from a distance, than he says, "I must have a breed of *him*," as he calls the first offspring between his own cow and this bull; and the cow is put to this animal, although the one should be Galloway, and the other a short-horn: thus his calves are so unlike, that, when his stock is carried to market, they present that tag-rag appearance which I have mentioned before, and which the best dealers are now rectifying to themselves for their own profit, by carefully classing them into horned or polled, &c. and thereby raising the value of the *self-same animal* from 10*s*. to 20*s*. a-head in the markets of the south, by giving them that uniformity which the breeder ought to have done.

When I would praise the advantage of crossing, I would have it then to be clearly understood, that it is only to bring together animals, *not nearly related*, but always of the same breed, never attempting to breed from a race-horse and a cart-mare, or *vice versa*. Such a thing may do well enough for once to get an insulated animal, but will end in vexation, if attempted to be prolonged into a line.

We know that crossing, even however ill-done, is productive of good. It uniformly frees an animal from many of the weaknesses and maladies to which those bred *in-and-in* are subject, and almost invariably procures a much larger animal than either of the parents. That enlightened gentlemen and accurate observer of everything connected with animals, Sir John Sebright, whom I shall frequently have occasion to quote, says, "I have tried many experiments by breeding in-and-in upon dogs, fowls, and pigeons; the dogs become, from strong spaniels, weak and diminutive lap-dogs; the fowls become long in the legs, small in the body, and bad breeders."

Mr. Bakewell, that illustrious breeder, denied this; and was the first, I believe, who said that a cross was unnecessary, that animals would not degenerate by being bred in-and-in, &c. but let us look to the result. His admirable breed of sheep are fast going to decay; they have even now become small, and are, to a great degree, what is termed soft sheep, *i. e.* liable to many complaints. The malady to which sheep are most subject, decay of the liver, attacks them very frequently, and altogether, they make good the old adage, of soon ripe soon rotten; more quickly coming to maturity than any animal we know, and as speedily going to decay. I have seen the wonderful effects produced by crossing, in renovating this breed, having, for several years, been in the habit of buying in a couple of scores of Highland ewes, and putting them to a pure Bakewell ram. They were always poor small things, worth not more than from 3*s*. or 3*s*. 6*d*. to 6*s*. each; yet these ewes produced lambs which astonished every one who saw them, and which sold to the butcher at 10*s*. 6*d*. a-head. As to the appearance of those lambs I shall have occasion to speak in another place. Did the limits of an essay permit, I could bring many more instances to prove this, my first position, that it is absolutely necessary to shun breeding in-and-in; but, as I must hasten to the main question, I shall only remark, that the benefit of crossing extends even to the vegetable creation, a fact which is now pretty well known, and may easily be proved in the cultivation of various plants. In none is it more conspicuous than in the turnip. It is now some years since it occurred to Mr. Gordon, farmer, at Orrock, near Aberdeen, that, as the brassica tribe easily breed together, as it were, it might be possible to cross the ruta baga with some of the other sorts. He did so, and found that the crosses which he had got were far superior in size to either of the sorts he put together, and also very hardy as to standing frost. I know another small farmer, who, after a very severe winter, tried putting red-top and Norfolk white turnips together, which are both very easily destroyed by frosts. From these he procured a cross which stood the frost uncommonly well, and grew to a large size on poor soil. But to proceed to selection.

In this term I would include, not only the choice of two well-made parents, but the guarding carefully that the same defects, however slight, did not occur in both; for it is a fact, stated by Sir John Sebright, and which has uniformly been proved by my own experience, that it is not always by putting the best male to the best female that the best produce will be obtained; for should they both have a *tendency* to the same defect, although, in ever so slight a degree, it will, in general, preponderate so much in the produce as to render it of little value.

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* Nearly related.

I found the truth of this in a very striking instance about ten years ago. Having a cart-mare of a very superior description [and which has twice gained premiums at agricultural shows] I looked out for a first-rate stallion, intending to breed from her. At that time a horse, belonging to Mr. Buchan, near Crief, called Blaize, was carrying all before him.* I thought I could not do better than breed from this horse, not taking into consideration that both sire and dam were of the same make, viz: rather long in the leg; the consequence was, that I had a very fine foal to be sure, but with longer legs than either of the parents. The next time I had learned to correct my former error, and bred from a short-legged horse from Cheshire, which was a great cross to my Scotch mare, and also differed from her in shape. The effect was immediately visible. I had a mare which it would be difficult to produce an equal to, the leg not being so short as the father's, although the whole appearance much resembled him, nor quite so long as that of the dam. Another very striking instance of this came under my notice a few years ago. A friend of mine [General Burnett] had a mare what is called three parts bred, certainly a very fine mare to breed from, but a very tall mare, with long legs, which was put to the longest legged thorough-bred horse I ever saw, (Bethlem Gabor, the property of Lord Aboyne.) The produce quite resembled the sire, and, at two years old, had reached the height of seventeen hands; but he was a monster, all legs, and very soon proved this by knuckling over at the pastern joint, till at last he could not walk; and at three years old was shot. The same mare was next covered by Hospitality, a horse as remarkable for being short in the leg, and what is termed short-jointed. The produce was now a low sturdy animal, greatly resembling the sire, and short in the leg;† thus in both instances proving, not only what I mention to be requisite, viz: judicious selection of the two parents in reference to the make of each, but also the great power of the male to change the whole shape and appearance of the produce.

I proceed next to mention the necessity of attending to *pedigree*.

If we look, with an attentive eye, to nature and to her productions, we shall see that they are not only beautiful, but that all she does is uniform. Thus every wild animal is of the same color, and nearly of the same shape; every flower resembles another; but man must always be assisting nature, as he terms it. Then we see flowers grow many colored, or perhaps double; beasts and birds change their shape, color and nature, so that we see such varieties as were altogether unlooked for.

The only way we can guard against this, is to know well what the *ancestors* of the animals we breed from were. Without this, our produce will every now and then be breaking through the general rules, and annoying us with odd-looking animals, deriving their shape from some of their ancestors, perhaps, two or three generations back.

Few words will suffice as to food, and care of the offspring. Nothing can be more absurd than to suppose that animals can improve if neglected in their youth.

We have the strongest proof of this in the starved animals brought from the West Highlands, which crowd our fairs, particularly those of Falkirk and Hallow Fair of Edinburgh. Let a farmer buy some of those when "year olds," and place them [ere they be at the age of maturity] in a more genial climate, and on good keep. See what beautiful cattle they become. Let him buy two-year olds, and the improvement will be less—at three, and they will only lay on fat, without reaching large size. On the other hand, let him purchase half a dozen starved looking small cows, from the same part of the country, in calf [provided they shall be of the pure breed;] let him take those cows home, and suffer the produce to suckle the dam while she feeds in good pasture. In winter, let them be well fed, and lie in a shed or house tolerably warm. What sort of beast has he now? Let the reader call to mind the West Highlanders shown at Queensbury House for the two last years, every one of which weighed from 70 to 80 stone, and the question is answered. I was once taken to see the cattle of the late General Simpson, who had the purest short-horn blood, a breed which, without all doubt, are capable of being made the fattest. These cattle were in such a state as I have never seen any other animals. They were all bone and skin, their eyes looked unhealthy; and altogether, from starvation, and I rather think from want of crossing, they appeared like so many invalids in the last stage of consumption. To improve any breed, or keep it up when improved, stock must be well fed from the time they are produced. "Sir," said a great breeder to me once, "to produce a fine animal, you must feed him from the starting-post." Warmth, that is a temperate climate, appears to be perfectly necessary to the improvement of all animals, and particularly so *in live stock connected with agriculture*; for, if we look at these animals, or even the human species, whether in the frigid or in the torrid zone, we find them dwindling into Liliputian size.

I come now to the grand point; to prove which, I conceive it will be necessary to fix upon some marks whereby a change, and that change an improvement, may be traced. The one, which in my mind is by far the strongest, is color; next, I would place smallness of the head and ears; in the horse, ox, and sheep, prominence of the eye; in all wideness of the chest, tendency to fatten, early maturity, tranquility, and love to man, or rather dependance on man.

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* This horse generaly cleared £150 per annum to his owner, gaining every prize at all the agricultural shows for many years; frequently being selected as the best, when 25 to 30 of the finest stallions from Clydesdale and Fife were shown in the same field; and was, without all doubt, a most superb horse.

† In the Philosophical Transactions for 1809, in a paper by Mr. Knight, on the same subject as this essay, the author, in contending for the impropriety of propagating from large in preference to small females, brings forward a very interesting remark upon length of leg in the offspring. "Nature," says he, "has given to the offspring of many animals (those of the sheep, the cow, and the mare, afford familiar examples) the power, at an early age to accompany their parents in flight; and legs of such animals are nearly of the same length at the birth as when they have attained their perfect growth." The natural result from which would be, that the offspring should resemble their mother in length of leg, and consequently, while there was an excess in this respect on her part, care ought to be taken to breed from a male, calculated by the comparative shortness of his legs, or the great depth of his chest and shoulders, either to correct the tendency or impart a body of proportional power.—Ed. Mag.

Let us now proceed regularly, and commence with the horse, as the most noble as well as the most useful animal. The influence that the male has on this class of animals is the most striking. Every one must recollect how, in blood-horses, the color of the sire goes throughout the progeny, and, in a dealer's stable, every grey is a Delphini or a Sir Harry Dinsdale, every black a Sorcerer or a Thunderbolt, and so on. While you hear people constantly remark that such a horse can be nothing but a get of such a one—what is this but to say, the color and appearance of the male goes throughout the produce? In work-horses it is the same. A very strong instance of this was visible some years ago in the county of Kincardine. Here there was not, I suppose, one single mare to be found of a chesnut-color, when Mr. Barclay, of Ury, brought down a Suffolk punch, of a bright red chesnut-color, and in a few years plenty of chesnuts were to be found. A few years afterwards, a dun or slate-colored stallion gained the prize from the Kincardine Agricultural Association; when he came into the country, dun-horses were very rare, now they are to be found everywhere. In the county of Fife, some years ago, a horse called Sportsman, found his way from Yorkshire, and covered a vast number of mares, particularly those belonging to the farmers, which at that time were either black or grey. This horse was a rich dark brown, with a tanned muzzle, and he instantly made a very large proportion of horses of that favorite color; and what is still more remarkable, he was himself one of the best trotters ever seen, and his progeny were so also, so that the farmers talking of a good trotter, would say, "O yes, he is a Sportsman." Sir Robert Dick, a few years ago, purchased a work-mare, which I happened to know the breed of for several generations. She was black, very large, and coarse; eyes small, head and ears large, and very rough at the heels. This mare was put to Caleb Quotem, a beautiful bay horse, with much of what dealers call gaiety. I saw the produce; it was bright bay, with no hair at the heels, the eyes large, the head and ears small, and altogether the produce had put on the appearance of a blood-horse. Here the dam was of the cart breed. Let us look the other way: Mr. George Harley Drummond had two or three thorough-bred mares, which had thrown foals, small in size and deficient in bone to a blood-horse. He put them to a cart-horse, they instantly produced stout boned colts, with much hair at heel, and altogether like the sire. In the year 1821, I purchased a very neat small mare for a relation of mine, which had a foal at her foot by a cart-horse; this foal turned out to all intents a very good cart-horse. The mare was afterwards put for three seasons to Kutuzof, and the foals were in all appearance like blood-horses.

The late General Ayton, of Inchdairnie, a great many years ago, sent down a horse from England to his property in Fife, which covered the country mares in his vicinity [at that time, I am informed, very poor beasts,] and produced such wonderful effects on the breed in that neighborhood, as may be seen this very day; the horses in that quarter being the best in the country, and particularly remarkable for width of chest, docility in work, and altogether fine animals. Last year [1824] I chanced to see the tenantry of a gentleman, who has the district which lies along the banks of the river Avon, in Aberdeenshire, driving his winter store of coals. The horses struck me as being far above the common run of those in the Highland glens, and in fact first rate, compared with what ten years before I had seen in the carts of the self-same farmers. I was at first somewhat at a loss to find out how so great a change had taken place, as I knew that the land in that part of the county was all held by small farmers, who neither could nor would purchase large high priced mares to breed from, far less those horses then in my view. I soon found, on investigating the matter, that the whole change had been brought about by good stallions; and in this way: The different agricultural associations in the north have, for many years, been in the practice of offering large premiums for stallions, which brought troops of fine horses from the west of Scotland. After the best had been picked out for the prize, the rest were set adrift; and these horses, dispersed over the country, of late years, from the badness of the times and an overstock of them, covered at any price the farmer pleased to offer. Thus good horses wandered into their glen, to their very doors, and at such a price as these men could give; the result was what I have stated.

In the horse, then, it seems clear that it is to the *male* we must look for improvement. Not that I would be supposed to assert that the whole improvement can be brought about *at once* by the male; that, if a man were to put a Shetland pony to Eclipse—such a one, for example, as "The Great Unknown" has been pleased to mount Mr. Yellowlees on—were the little beast, from which the agriculturists' legs dangled, put, I say, to Eclipse, no one would hope to procure a racer; nor can we think that a Lincolnshire black, and a Highland garron, taken out of a peat cart, will produce an animal fit for a London dray; but by repetition the end will be produced. I once put the question of the Highland Society to a very able man who fills a chair in one of our universities, and who is an observer of nature of no ordinary cast, and who also, from his profession, (a medical man) may be supposed to be a good judge. His answer instantly was, "The male, without all doubt, but (added he,) you must have a female capable of developing the good properties of the male, otherwise a good male will be thrown away."

I would next look a little at the influence the male has on the *ox*. Here, although I still see the male have by far the greatest influence, I would say that there was a shade of difference, perhaps five per cent. less than in the horse. The cow appears to be an animal whose progeny is often much affected by her imagination during the time of conception, or rather during the period when she is in season. We have the most ancient, as well as the highest authority for this, in the peeled rods of Jacob; and from what my own experience, as well as the information of trustworthy men, has taught me, I am inclined to think that the calf very often takes after the beast that has been jumping on the cow, (whether ox or cow,) previous to her being taken to the male. One of the most intelligent breeders I have ever met with in Scotland, Mr. Mustard,* an extensive farmer on Sir James Carnegie's estate in Angus, told me a singular fact in regard to what I have now stated. One of his cows chanced to come into season while pasturing on a field which was bounded by that of his neighbors; out of which field an ox jumped, and went with the cow until she was brought home to the bull. The ox was white with black spots, and horned. Mr. Mustard had not a horned beast in his possession, nor one with any white on it. Nevertheless, the produce of the following spring was a black and white calf with horns. I have twice had pure Ayrshire cows, which are uniformly what is called red and white, with horns. The first of those I put to a brown bull without horns; the produce was very dark red, without any white, and polled. The next cow was put to a jet black bull with horns. The first produce was dark red, without any white, and the next was jet black, and also without any white; and in both cases the make of the progeny took greatly after the sire. On settling in the north of Scotland as a farmer, I soon perceived that one of the greatest defects in the cattle was a tendency to be knock-kneed behind, and in my endeavors to get rid of this, I procured a bull from the south of Scotland, free from that defect, and with him crossed the best looking cows of the country. I instantly got rid of that narrowness behind observable in all cattle where no attention has been paid to the breed; and, in a few years, by drafting such queys as did not please me, and breeding only from good shaped ones, I made a breed for myself, which I had done before I knew it, for, having one season lost almost all my own calves, I was, in consequence of this misfortune, forced to buy in calves. These were treated in the same way as to food, &c., as my own, yet those from my own cows soon shot far a-head of them, both in size and condition; and on examination of the two sets of animals, an evident superiority of form existed in those of my own, especially in the smallness and beauty of the head, with a prominent eye; and, a fact not hitherto mentioned, that of the tail being one-half less as to thickness than in the unimproved breed, while a wide chest, (that unerring sign of a good and quick feeder,) was very conspicuous.† It would seem that horns had been given to the cow by nature, and that the polled breed have been procured by selection of some of those varieties we so often see, as I observe that it more frequently occurs, when a polled bull is put to a horned cow, that the produce resembles the mother in that particular, than when a horned bull is put to a polled cow, when horns are almost always the consequence.† A great many years ago, the present Sir Alexander Ramsay, of Fasque, brought a few of the Lancashire cattle to Scotland, a breed then much in fashion, and, as every one knows, remarkable for having uncommonly wide spreading horns, and all with some white, especially on the back. These cattle were intermixed with the cows of the country; and when Sir Alexander came to his estate, the cattle were all horned. About that time the polled or dodded cattle came greatly into vogue in Angus; and Sir Alexander purchased, from time to time, jet black polled bulls, so that in a short time all his cows were of this sort. Nevertheless, every year, even to this day, one or two of the calves "cry back" to the Lancashire, having white, and hornes; and, what is singular, it is almost invariably in the male that this takes place.

An instance of the influence of the male in the progeny of the cow is narrated by Bewick, the natural historian. He is treating of the original breed of wild cattle, which still exists in a few parks belonging to noblemen in the north of England, and in one or two places in Scotland. They are uniformly pure white, with black, or sometimes red ears and noses, and always extremely wild and fierce. At Chillingham castle, in Northumberland, says Bewick, cows used frequently to be turned into the park when in season, which were covered by the wild bull; and what is strange, the produce from all those cows were uniformly white, with red ears and noses, and greatly partook of the character and qualities of the wild bull. Here, then, is a very strong proof of the influence of the male parent, and others equally strong could be quoted, did I not think it better to pass on to another animal, the *sheep*.

Here the influence of the male parent is most striking. I have stated in a former part of this essay, that I have been in the habit of purchasing a couple of scores of highland ewes every year, to put to the Bakewell ram. Let us look a little at the characteristics of every breed in a wild, or at least nearly wild state. We find them muscular, active, restless in quest of food, ever in motion, and refusing to lay on fat.‡ Such I found the highland ewes; they were all small, with black legs and faces, and had horns. On being put to the Bakewell, they produce lambs of a totally different breed from themselves, all having the greatest tendency to get fat, the wild, wiry appearance of the Highlanders being entirely gone; and in its place we have a round fleshy animal, resting peaceably in the fields, the desire to break over fences, having likewise disappeared; and what is remarkable, not a single lamb is to be found with black legs, or a black face, and scarcely one with any sort of horn,§ while all are of a very large size. They thrive remarkably well, any that I have allowed to grow up as an experiment; and I have always found them much more free from disease than either the Bakewell or the black-faced sheep, particularly the rot of the liver, which makes dreadful havoc amongst the Bakewell; nor does it spare the Highlander, especially when put on high keep. I cannot speak much of the appearance produced by a Highland ram with the Bakewell ewe. Being fully convinced of the power of the male on the offspring, I have always accounted it as loss to put a bad male to a high-bred female, and have never done so. I have, however, observed, where the country people have purchased high-bred sheep at any sale of mine, and bred from them with the ordinary rams, that the breed very quickly got bad, whereas, when a Bakewell ram had been purchased, I have seen a most remarkable change on the quality of the sheep; and in several instances where the ewes had been tolerable from which they had bred, the cross was so nearly resembling a new Leicester, as to deceive any one who was not a thorough judge. As I wish to confine myself to facts which have come under my own observation, I shall forbear to mention circumstances which tend to prove the great power in the male as to influence in the progeny of the ewe, as I have them from others; and shall conclude with the *sow*.

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* This gentleman's stock are all jet black and polled, and so remarkably alike, that they show much care in attending to the breed.

† "An observation which Dr. Jenner made to me about ten years ago, (the truth of which has been since confirmed by my own experience,) that no animal whose chest was narrow could easily be made fat, applies particularly to the Merino sheep, which are in general contracted in that part, and is well worth the attention of those who wish to improve this breed."

Sir J. Sebright.

† An old French writer on agricultural subjects imagines that polled cattle are degenerated. He says, "Mene en Ecosse on trouve la race tres petite, et fort souvent sans cornes."

‡ Look at the hare and the goat, however well fed, they will refuse to lay on fat.

§ Some few have a sort of shrivelled horn, which drops off, or more commonly they rub them off in the autumn.

The influence of the male in this animal is as great as in the sheep. A few facts will show this. A friend of mine, soon after I commenced farming, [thinking, no doubt, to do me a great kindness,] made me a present of a sow of the wild species, in pig to a boar of the same sort. She was sent to me by sea, and during the voyage she broke out of the crib into which she had been put, and when the crew attempted to replace her, she attacked them with open mouth, and forced them to take shelter in the rigging. I put her into a high walled field, where she showed every mark of a wild animal, starting off at the least noise, and running very swiftly to some concealment. When the time of littering came near, she set to work, and carried in her mouth great quantities of withered grass and rushes, till she had a heap the size of on ordinary hay-cock. Here she had ten young ones, so concealed that no trace of them could be seen. When the heap was approached, she made a noise something like the bark of a dog, ran furiously to attack the person who had the temerity to invade her abode. In a short time the young ones made their apperance, they were all perfectly alike, being of a red or dark yellow color, with regular black stripes, like a tiger or zebra, down the sides. As they grew old they became darker, till they resembled the sow, which was of a port wine color. When it became necessary to take them, the mother was secured by a noose thrown over her, and the young ones were hunted down by a number of men. When escape was impossible, they gave battle, and offered to bite very furiously.

I now put the old one into confinement, where she had a second litter to one of the pigs, which were in all points like the first. I next put her to a boar of the Duke of Bedford's improved breed. At once the litter had a totally different appearance; the pigs were all different from each other, some had a slight kind of stripe, some none, some were light, some dark. Those which had stripes when littered lost them, and grew lighter in the color as they grew up. The leg had become shorter, as had the snout. They soon inclined to come out of the inside stye to the feeding trough, when the feeder put meat in it, and would feed while he stood by; and, lastly, they proved much better thrivers, getting very fat, which the old one and all the former pigs refused to do. I gave a neighbor a boar of the first litter which he put to several of the Duke of Bedford's sows, where the change was equally manifest; the zebra stripe, the long snout, and the length of the leg appearing in the whole of the young ones. I was now very sick of the sight of them, and sold them all off.

My stock now consisted of a cross between the Duke of Bedford's and Squire Western's improved Essex, and were as fine as any I ever saw, being as remarkable for tameness and good nature as the sort I have been speaking of were for the contrary. After breeding from these for some years, they at last got such a tendency to get fat that they were entirely lard, and almost useless from being too fat. Pork at this time had declined so much in the market, and the prices were so far from remunerating ones, that I parted with my whole stock but one sow at what they would fetch, thinking the first loss the best. From this sow I had too litters [previous to reducing my stock,] by the full bred boar. They were like herself, short in the snout, had very small ears, hardly any legs, and were so tame that they would eat a few oats out of the man's hand who fed them. Having now no boar of my own, I had to look out for one; and being informed that a gentleman and neighbor of mine had a pretty good one, I sent a man and a cart to beg the loan of him. I chanced to be in my yard when the man returned. My surprise was great when I found he had a beast muzzled and tied down with a quantity of ropes; and on his being turned into the sty, he proved to be a beast raving and foaming at the mouth, with long legs, a long snout, ears twice the size of the sow, and a long shaggy coat covering lank sides. In short, it looked as if my man had got a hyena out of Mr. Polito's caravan, rather than a boar from my neighbor's farm-yard; and, when put together, they by no means answered to the words of the old song:

> "Oh sure a pair was never seen
> So justly formed to meet by nature."

The offspring of this alliance was exactly what I expected; the cross had greatly increased the size, the pigs being longer than either of the parents, while much of the boar was to be discovered in them; the snout had considerably lengthened, as had the ears and legs. The whole of my breed were pure white, with hardly any hair on them. The pigs were some black, some spotted, and had a sufficient supply of bristles; and above all, they were lively, active, wild things, refusing to come near their food while any one stood by, and had lost much of the tendency to get fat.

(To be continued.)

STRICTURE AND DEFENCE. HAS SILK-CULTURE BEEN STRONGLY AND UNEQUIVOCALLY RECOMMENDED BY THE FARMERS' REGISTER?

We have just been shown by a friend a passage of a private letter (dated Feb. 12th,) intended for reproof and correction of our editorial course, in the matter stated. The lines are as follows:

"I do not think the Farmers' Register is taking the right attitude in this matter. Why does not the editor give his subscribers at least one essay from his own pen, of no *equivocal* character, in favor of going directly into silk-culture?—of our giving up at least a portion of the cultivation of tobacco, and substituting the growing of the *morus*, and the actual making of silk? I think that an article of this kind from his pen has been looked for by many, and would produce effect. But instead of this he seems inclined to accord in sentiment with that most excellent man ————, who, for some time past, has been making for himself a hobby, out of the exposure of the hobby-riding of others. Now, my opinion is this: If the mulberry speculation be a mania, every man ought to do his utmost in giving to that mania the happiest direction. Urge it—urge it *onward* to the making of silk."

The writer of this remonstrance is a gentleman for whose talents, virtues, and patriotism, we entertain great respect, and whose censure, therefore, we are very unwilling to bear. And as the opinions of one so intelligent may also be entertained (and indeed we have had sundry such intimations from other quarters,) by others of our readers, we shall beg leave to prove that they are mistaken, by quotations from the words, or reference to the substance of what we have said, and in language "of no *equivocal* character," to *urge* the adoption of silk-culture in Virginia; and that not only recently, since the mulberry speculation has given a very general direction of our countrymen's views to silk-culture, but for years before, when no one else in Virginia had raised a voice in favor of its adoption, and when for years thereafter, there was no echo, or favorable response to our own expressions, which probably then passed unheeded by our friendly censor, because he then felt no interest in the subject. We beg of him now, and our readers in general, to read again the passages quoted or referred to, which are hastily selected by glancing over the "editorial remarks" in the index of each volume. Every person who has the volumes in possession may resort to the same sources of information, and may read many *later* editorial opinions more fully stated, and more strong, than any we will here quote; and may also see whether we have omitted any thing of opposite tendency. But we readily admit this—that we *cautiously*, and but slowly at first, became convinced of the absolute and certain and remarkable fitness of Virginia, and a large portion of the United States for silk-culture—and we have not on this, or any other proposed improvement, expressed conviction, and certain assurance, before being truly and entirely convinced and assured of its value. If that degree of caution—which we deem due, both to truth and to the claims and interests of our readers—has subjected our words to the charge of being "equivocal," then we must be content to bear it, as unpalatable as that word may be. But except that we have not "run riot" in setting forth and exaggerating the benefits and supposed profits of silk-culture, and have not guarantied the truth of the very common estimates of enormous conjectural profits, (which course would perhaps have satisfied the most sanguine projectors—and would have displeased no one—) a fair review of all that we have said on this subject, will show, at first, a reasonable and sufficient support of the introduction of silk-culture, gradually increasing to the conviction and certain assurance of its very great value for Virginia. Readers are apt to notice very slightly, if at all, opinions on subjects in which they feel no interest; and also, opinions which are much more moderate than their own, on subjects in which they feel even great interest. We infer that to one of these two causes must be ascribed our friend's finding our praise of silk-culture either too faint or "equivocal." But if he were as warmly enlisted in feeling on the other side, and deemed the business altogether unsuitable to this country, we suspect that he would have seen, in sufficiently bold relief, and would have strongly condemned, our long continued, frequent, and *unequivocal* recommendations of a new culture, deemed by the censor as likely to injure, and in no way to benefit, the agricultural interests of this country.

The first volume of this journal (commenced in 1833,) contains no editorial writings in recommendation of this business; but sundry selected articles, either instructing as to the management, or showing the progress made in silk-culture in remote parts of the United States. In the second volume commenced sundry translations made for this journal, from recent French publications imported specially for the purpose, and which constituted the only, and yet a very valuable source of supply of such information on silk-culture to this country. In presenting these translations, we were *in advance* of the interest and demand of the public; and hence they were then but little noticed or prized. In the publication of our third volume, (at which time the subject was attracting more general attention in the northern states, though still almost none in Virginia,) and more and more since, our extracts and translations increased, with the supply of materials, and with the increase of interest evinced by the public; and latterly we have feared that we had urged the importance of the subject of silk-culture on our readers to the degree of satiety, if not of disgust, to those who are not as zealous and as sanguine on the subject as our friend is, and as we claim to be. We proceed to present the extracts of editorial remarks.

In vol. iii, Farmers' Register, (1835) page 433, occurs the earliest editorial article on this subject, It follows an account of the principal silk companies which had then been started. The only omitted portion merely presented some well-established and striking facts in evidence of the fitness of the native mulberry *(morus rubra)* for feeding silk-worms.

"The foregoing article shows at a glance that the people of New England are about to make silk-culture a large and important branch of their rural economy. It is there no new and untried speculation. The business has long been pursued in Connecticut, and with results so satisfactory as to induce these recent and far more expensive investments for the same object. If good profits can be there made, in the cold and unfriendly climate of New England, (where it is yet a problem to be solved whether the best species of mulberry can stand the winter's cold,) how much more profitable would the business be in Virginia, and the more southern states? Our *cheaper* slave-labor would also afford advantages; and many aged or infirm hands could be profitably employed in this business, who are now a useless expense to their owners. Much land that yields no net profit under usual crops, would serve well for mulberry trees.

"The opinion expressed above of the worthlessness of the native (black or red) mulberry tree, [*morus rubra*] for yielding silk, is as general as it is erroneous—and the error (though of use to nursery-men,) is very injurious to the community, in causing all efforts in silk-making to be postponed until mulberry trees can be reared. Now, though professing to know very little of silk-culture, we will venture to assert that those who can *succeed well*, by using leaves of the white mulberry, will not *fail*, nor do a much worse business, with the black. The black is doubtless somewhat inferior to the white mulberry, as this is to the Chinese: but the difference of products from either two, would not be so great as would be made by the difference of care and management of almost any two new silk-growers."

"But while we advise those who wish to rear silk-worms to use the native mulberry trees, if they are ready and convenient, we also recommend to them the immediate planting of a better kind, and especially of the new Chinese, (or morus multicaulis,) for future use. If there is doubt whether this valuable tree will thrive farther north, there can be none here; and as it furnishes undoubtedly the most abundant and nutritious food, and as the silk business *must* extend rapidly, every acre of land now, or soon, planted with cuttings of this tree, will be almost sure to yield a highly profitable crop, either for sale or for use."

In the same volume, p. 674, the following remarks introduced a long and elaborate estimate from the Albany 'Silk-worm,' of the expenses and profits of commencing and carrying on mulberry and silk-culture.

"We are not competent to decide on the correctness of the following estimates, which however rest upon the respectable authority of the editor of the journal from which they are copied. But *this* we are prepared to maintain—that if such profits can be obtained near Albany, much greater would reward similar efforts in Virginia, on account of our greater cheapness of land, cheapness of the labor which young or infirm slaves, now an expense, might supply—and still more, on account of our longer summers and milder winters.

"Most of our readers possibly—and certainly most of the southern people who are not our readers—have no idea of the recent great and rapid extension of silk culture in the comparatively unfriendly northern states. Joint-stock companies have been formed in almost every northern state, and large capitals invested, to carry on the entire business, from raising the mulberry trees, to the manufacture of the products of the worms. Either these people are mad, or we in Virginia, (especially of the middle region,) are in this respect, more than usually blind to our own interest.

"Three new periodical journals are specially devoted to giving information on silk-culture—and three new treatises or manuals have been published, in addition to the several of somewhat older date. These facts, even more than the formation of joint-stock companies and the investment of large capitals, prove that the public mind and interest are awakened—that knowledge is every where sought—and that truth must speedily be found, and generally acted upon. Would that such a spirit of inquiry existed in Virginia, either as to silk culture, or any thing else in which our true interests are concerned!"

At page 731 of vol. iii, in some remarks in support of our previously expressed opinion that the seeds of the morus multicaulis would not produce the same kind, and in reply to Mr. Roberts, who maintained the contrary, occur the following passage, which, as well as many others previous and subsequent, exhibits proofs of early interest felt for the propagation of this valuable tree, and of *good service offered* to the public, in information in regard to its propagation, which, if heeded, would have prevented many impositions, losses, and disappointments, by purchasers relying on the seeds, or pretended seeds.

"We were the first to make known this European opinion, (in an article translated for the Farmers' Register;) and deeming it both true and important, we have frequently endeavored to impress on those who were about to raise mulberry nurseries, not to trust to the seed of the morus multicaulis. In this we certainly had no private interest to serve, either direct or indirect; to which influence Mr. Roberts attributes the objections of some persons to the use of the seed. We have presented before, and shall again, in the following piece, opposing views, as freely as our own; and we should be highly gratified if our brother editor and esteemed fellow-laborer in this cause, can maintain his position—which would be the means of introducing this valuable plant far more rapidly and widely, than merely by the use of cuttings."

The next editorial article (vol. iv, p. 126) will be copied entire. In explanation of the failure of the scheme there announced, and in regard to which we were then so sanguine, it is proper to state that the execution was not even commenced.

It had been started by a single individual, who was expected to undertake the entire management, and on whose zeal, care, and judgment, all the other subscribers of stock entirely relied, and were willing to venture their money, though without intending to give any of their own time or attention. A change of circumstances prevented the gentleman, on whom all operations depended, from undertaking the charge; and, therefore, no action was taken as to the scheme.

"A company has been very recently made up in this place to begin the business of mulberry and silk culture, as soon as the proper season arrives; and from our knowledge of the individuals who have commenced this exterprise, we can safely predict, that there will be nothing wanting to insure success, if zeal, energy, intelligence, and the investment of sufficient capital, can command it. We rejoice most heartily in this movement, and consider it as the germ of future results of incalculable value to this region. In all our many efforts, made through this publication, to urge the commencement and zealous prosecution of silk-culture in Virginia, we have not pretended to have any personal knowledge of the particulars of the business, or the grounds on which to estimate profits. But we have assumed this general position, which we think cannot be shaken—*that if silk-culture is profitable in New England,* (as it undoubtedly is,) *much more profitable must it be in lower and middle Virginia.* We have superior advantages, (for this purpose,) to our northern brethern, in our warmer climate and longer summers, the very low prices of lands, and also in a large amount of labor, altogether suitable, and which yields nothing for other purposes. Lands in the central region, exhausted and hilly, but well suited for the growth of the mulberry, may be now bought at $2 or $3 the acre. For land of much less value for silk-culture, the silk companies of the north seldom pay less than $100 the acre. So great is the difference in these respects, that we have long entertained the opinion, that by far the best course that a northern silk company could take, would be to establish its operations on a large scale on lands in Virginia.

"There is an establishment already existing in Petersburg, which is admirably suited to be devoted in part to raising silk. This is the Poor House farm. This establishment is unusually well regulated, and has already every thing necessary to carry on the silk business on a large scale, except the mulberry trees, and a cheap additional building for a cocoonery. There is enough and good land to plant—plenty of suitable labor, there being usually 30 or more young or infirm paupers, most of whom are fully competent to attend to this light work, and whom it is impossible now to employ, profitably, if at all; and moreover, there is already existing that constant and excellent supervision and strict attention, which are indespensable to the success of the silk business, and which it would be both costly and difficult to obtain for a new establishment. Nor would the adoption of this suggestion create a rival to the silk company just formed. On the contrary, every like experiment would serve to aid and increase the lights, and to lessen, by sharing the losses, caused by inexperience, of every other new establishment. There is no danger of overstocking the silk market, even if silk were cultivated on every farm in Virginia, between the falls of the rivers and the mountains.

"In all the northern states, individuals and societies are every where going into the silk-business. Many and large capitals are already invested—and every week there are annunciations of other new undertakings. No one there expresses even a doubt of the success and profit of the business: and it should be remembered that silk-culture has already been carried on profitably for more than half a century in Connecticut.

Wherever the white mulberry tree grows, (no matter of what color the fruit may be,) proprietors ought to save the seeds of the present crop, as largely as possible. There can be no crop planted that will yield more profit, for sale, than the young trees, unless it be of the still more valuable Chinese mulberry. The white mulberry grows abundantly along the shores and banks of James River, and probably on all our tide-waters."

In the same volume, p. 251, the following is the first part of an editorial article on "*Anticipated changes in the agriculture of the United States.*"

"Some considerable time has now passed since we yielded, slowly and with difficulty, to the belief, that the introduction of silk-culture in this country would be extended widely and profitably: and since adopting that opinion, we have made continually repeated efforts to impress on the people of Virginia, and the other southern states, the superiority of their facilities—in better climate, cheaper land, and the surplus and now expensive hands—for carrying on this new business, over those of our northern countrymen, who have already proved the advantages to be derived, and are investing large capitals in numerous adventures for this object. In New England, where most of these efforts are making, there is no superfluity of labor. Fortunately, every poor female, and all persons infirm from either tender or advanced age, may be, and usually are, employed profitably, according to their measure of bodily power. Yet still it is considered profitable to *divert* much of this labor to the silk-business: and that too, in a climate so rigorous that artificial heat must be used frequently in rearing the worms, and the best kinds of mulberries are often greatly injured, if not killed to the ground, by such severe winters as the last. In Virginia, there is no difficulty as to climate—thousands of now unemployed and expensive hands might be given to the work—and lands, now unprofitable or neglected, and at very low prices, would serve as well for planting, as those selling ten or twenty times as high in New England."

At page 335, vol. iv, after giving the resolutions of a public meeting in Loudoun, which recommended the introduction of silk-culture at the poorhouse of that county, we added the following comment:

"We rejoice to see, in the above resolutions, a movement on the plan which we have before recommended, and still consider one of the safest grounds on which to commence silk-culture in Virginia. Each of our county and town poorhouse establishments furnishes enough of land, labor, superintendence and capital, for this purpose. Let this most suitable direction be given (and in proper manner,) to these now wasted means, and poor-houses might perhaps cease to be nuisances—expensive, not only of public money, but of the labor and morals of the most destitute class of society."

All these strong expressions *preceded* public opinion or feeling in Virginia, and therefore were neither profited by, nor perhaps scarcely noticed, by our readers. But they certainly will suffice to show that our recommendations of silk-culture were neither wanting nor "equivocal." Since the recent mulberry mania has been raging, and there has thence sprung up, (most fortunately, though by most illegitimate deduction,) a more general and a very strong disposition to enter upon silk-culture, our own previous favorable opinions have been more and more strengthened by the acquisition of new facts; and these opinions have been stated repeatedly, and at length, in sundry articles in the sixth volume, and in the preceding pages of the current volume. It is true that our zeal, and estimates of profits, are still much in the rear of the most sanguine—that we have insisted that the *dealing in mulberry plants is not silk-culture*—and that, unless turned to silk-culture, the mulberry speculation would be but a bubble, not only worthless, but injurious to the country. We have also presented, fairly, selected articles on both sides, as to the recent appreciation of the morus multicaulis; and moreover, we have been backward in expressing our own increasing estimation of the market value of these plants, (as founded on the manifest growing movements towards silk-culture,) because we were fearful of being subjected to a charge directly the reverse of that of our friend—that is of aiding to increase the excitement for buying mulberry plants, because our own private interest would have been greatly benefited by increased demand. We know that our friend has had no such private interest to increase his fervor, or to impose a restraint upon his words of advice to the public. If he had, we are sure that he would have felt the weight of such trammels.

But however restrained, we claim that our expressions in recommending silk-culture proper, have been numerous, strong, and any thing but "equivocal;" and we may claim as much in regard to the necessary branch and the foundation of silk-culture, the propagation of the morus multicaulis, the best mulberry tree for feeding. We shall not quote, but merely refer to, these numerous passages, which form no inconsiderable portion of the editorial articles of the last and current volumes.* And we are now enabled to add to the full exposition of views given at page 60 of this volume, that every day's information since that publication, has served to show that silk-culture proper is about to be commenced in very many parts of the country, and to such extent that we now have no doubt but that trials sufficiently numerous will be fairly made in this and in the other states, to establish the business, and to insure the increase of it to great extent by the next year. This is all that is wanting to establish also the certainty of the profits of rearing multicaulis plants this year. The recent granting of *very* liberal bounties by the legislature of Georgia, for all silk made in that state, for the next ten years, will greatly forward this end, even if no similar measure should be adopted in any of the other southern or slave-holding states. A similar law has just passed the lower house of the Ohio legislature. Seven other, at least, of the middle and northern states had offered bounties previously.

In making the foregoing quotations and references, in evidence of early and earnest support of the suitableness of silk-culture for Virginia, we have not gone beyond the pages of the Farmers' Register, because we have no right to suppose the opinions of its editor to be known elsewhere. But we will add here, that a much more full and elaborate argument, in support of this very object, has recently been addressed to this community from the same source, through a different form of publication. The material part of that argument will be presented in the next number of the Farmers' Register; and if it does not serve to convince the public of its soundness, it will, at least, leave no doubt of the earnestness of the writer in the maintenance of his proposition, that Virginia is not only well suited to profit by silk-culture, but better suited than any part of Europe.

From the Farmers' Cabinet.

FOOD FOR SHEEP. CAUTION.

Dear Sir,—I have sometimes observed potatoes recommended as food for sheep during winter. I have no doubt they are highly nutritious, but they should be used with caution, as I have found that they are injurious to ewes before they have dropped their lambs, as they cause such a flow of milk that the udder becomes so hard and the milk caked or thick, that the young lambs are unable to draw it out; and without the precaution of milking it out, the lambs must perish. After the lambs have come, potatoes may be fed to the ewes without danger, and will cause the lambs to grow rapidly. Turnips may be fed to sheep at any time without injury to the lambs. Yours, &c. S.

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* There are so many of such passages, and entire articles of great length, which have been published within a few months, that it would be superfluous to quote any. We may refer generally to all the Nos. issued since last July, and particularly to the following editorial articles: On Mr. Hicks' experiment, page 379; on the peculiar fitness of Virginia, for silk-culture, 391, and 464, 5, intrinsic value of the morus multicaulis, 391, 464, 467, 493, 497, 500, 504 of Vol. VI, and of Vol. VII, the full exposition of views presented at page 60; and several others in the previous pages of this number, which were printed before the message of reproof was received.

Chesterfield, N. J. Jan. 8th, 1839.

For the Farmers' Register.

MONTHLY COMMERCIAL REPORT.

A regular business has been done in most articles during the month. Tobacco maintains the high prices quoted in our last—say $9 to 20. The quantity brought in for inspection has increased, but the quality does not improve much; the principal receipts consisting of green unmerchantable lugs and leaf, unfit for export. The export of the month is under 300 hhds—old.

Cotton has advanced, not in consequence of the improvement in foreign markets, but from the diminished supplies in our own; which strengthens the impression that the crop will prove considerably short of the last, and furnish a supply not fully adequate to the demand, on as extensive a scale of consumption as existed last year.

The receipts are, 730,000 against 910,000 bales, the exports about 300,000 against 550,000. Prices are nearly fifty per cent. higher than in February last, but manufactured articles have not advanced in proportion with the raw material.

The last accounts from England disappointed the expectations of holders of grain and flour. Prices had declined a little, but the averages (78 or 79 shillings per quarter) were considerably above the rate which admits these articles at the minimum rate of duty. Great exertions are making in England to abolish the corn laws, and there is considerable popular excitement there on other subjects. The exportation of grain from the Atlantic ports of France, and from Sicily, has been prohibited.

It is stated that on the 20th December, one hundred and twenty-four vessels were taking in cargoes of wheat and barley at Odessa, and so at all the other ports of the Black Sea. The Emperor of Russia had loaned three-fourths of the grain in the government reserves, to be divided among such merchants as had foreign orders; to be paid in six months without any interest.

The exportation of flour from this country to England has been checked by the recent advices, and the stocks in our markets will be greatly increased at the opening of spring.

The price of flour in our markets is $8 to 8¼ and of wheat 160 to 170 cents; corn 90 cents.

Bacon has declined to 10 to 11½ cents.

Exchange on England 9 per cent premium.

Feb. 25th. X.

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ERRATUM.—In editorial introduction on page 112, for "1833," read "1834."

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Thomas Hicks	Brunswick	John L. Davies	Chester, S. C.
James P. Harrison	do.	Michael Browne	Salisbury, N. C.
Edwin G. Booth	Nottoway	Thomas Carskadon	Hampshire, Va.
John J. Garnett	Charlotte	John Myers	do.
Charles Ellis	Richmond	James B. Marsh	Washington, N. C.
Robert Hunter	Campbell	William M. Marsh	Beaufort, N. C.
Joseph T. Granbery	Bertie, N. C.	Robert Bailey	Westmoreland, Va.
John A. Sutton	do.	James Saunders	King & Queen
Benj. Sumner	Person, N. C.	John Foscow	Jones, N. C.
Algernon Stafford	do.	R. G. Fonville	Newbern, N. C.
Robert H. Harden	Clarke, Ga.	James Fowzer	Livingston, La.
Alfred Leyburn	Rockbridge, Va.	L. E. Generally	New Orleans
Edw. Graham	do.	James E. Rembert	Mechanicsville, S. C.
John Ruff	do.	H. D. Green	do.
John A. Finley	do.	Peter Hulme (7th and 8th)	Philadelphia.
Reuben Grigsby	do.	C. E. Hiester	Harrisburg, Pa.
J. D. Ewing	do.	Ro. G. Strachan	Dinwiddie, Va.
Nathan G. Paxton	do.	Theophilus Strachan	Surry
Edward Scott	Powhatan	John D. Hawkins	Granville, N. C.
E. Rogers	Princess Anne	Robert Harvie	Raleigh N. C.
John M. Hodges	Norfolk Co.	Robert Haywood	do.
J. L. Morgan	Nottoway	F. J. Haywood	do.
Wm. T. Wills	do.	Asa Dupuy	Prince Edward, Va.
Nicholas Wills	Richmond	James H. Dupuy	do.
Joseph S. Barnard	Sussex, Del	George S. Hollyday	Kent, Md.
William D. Waples	do.	Agricultural Society of Kent, Md.	
David Meade	Brunswick, Va.	Chester Root	Mobile
N. W. Smith	do.	John P. Dupuy	Nottoway, Va.
Wm. E. Nelson	Hanover.	T. E. Jeter	do.
William Jones	Lancaster	Th. Ap. C. Jones	Fairfax
Raleigh Dunnaway	do.	Jonathan Hunter	Princess Anne
John B. Downman,	Fauquier	Bennet Land	do.
William E. Taylor	Norfolk, Va.	Peter Steinberger	Mason
Joshua Harrell	Nansemond	Agricultural Society of Mason, Cabell, and Kanawha	
Edwin Jordan	do.	William O. Gregory	Granville, N. C.
William Carmichael	Queen Anne, Md.	Thomas B. Barrett	do.
Richard Carmichael	do.	Eldridge G. Cabaniss	Monroe, Ga.
Henry C. Moore,	Albemarle, Va.	Henry H. Lumpkin	do.
James A. Meriwether	Campbell	John W. Rutledge	Harford, Md.
Wm. N. Meriwether	do.	A. J. Street	do.
J. Coleman	Lenoir, N. C.	Colin M. Clarke	Halifax, N. C.
Library of Franklin College	Athens, Ga.	George E. Holt	Mobile
Robert Butler	Isle of Wight	Patrick Byrne	Blakely, Ala.
William Green	do.	Melancthon C. Read	Charlotte
John C. Epes	Lunenburg	J. P. C. Peter	Montgomery, Md.
John C. Stokes	do.	Robert Dick	do.
Anthony Smith	do.	George Peter	do.
Peter P. Penn	Patrick	Henry Dunlop	Frederick, Md.
[illegible] McDonald	do.	H. W. Latane	Essex
Edward W. Hubard	Buckingham	Winter Bray	do.
Robert T. Hubard	do.	Benjamin F. Jones	do.
Henderson Lee	Lunenburg	W. H. Benton (7 and 8)	Vicksburg, Mi.
William Dillard	Surry, Va.	Geo. D. Baskerville	Warren, N. C.
Patent Office	Washington	Lewis Mabry	Petersburg, Va.
H. L. Ellsworth	do.	Daniel Sickels	do.
[illegible]	Nottoway	J. P. Vaughan	Amelia
John Spratley	Surry	Henry J. Harrison	Sussex
William H. Harrison	Amelia	John E. Parham	do
Lawrence Washington	Westmoreland	Edward H	King William
James S. Quesenberry	King George	Wm. Boulware	do.
Robert H. Montgomery	do.	John T. Wormley	do.
Thomas R. Dilly	Westmoreland	John Sizer	do.
Nathan Hunt	Guilford, N. C.	Wm. Gwathmey	do.
William Douglas	Columbia, S. C.	Geo. R. Trant	do.
S. B. Morrison	Mecklenburg, N. C.	Achilles Campbell	do.
[illegible]	do.	Wm. L. Davidson	Mecklenburg, N. C.

☞ For want of space on this cover, the credits of all payments for vols. 1, 2, 3, 4, and 5, (though in type,) are necessarily postponed to the next No. when they will appear.

PRICES CURRENT--Feb. 27, 1839.

COUNTRY PRODUCE.

Wheat,	$1 60 to 1 65	Tobacco,	$9 to $18 00
Flour, (superfine)	8 to 8 25	do. (lugs)	$7 75 to $10 75
Corn, per bushel 90 cents,		Bacon, (hog round) 11 cts.	
Cotton,	13 cts. to 15		

BRANCH, WINFREE & Co.

All advertisements which were expected to be on this cover, and do not appear there, will be found in the Country Advertiser, issued at the same time, and sent to a numerous body of other readers. When, for want of space, this change is made, without being ordered, two insertions in the Advertiser will be given for the one omitted on the Farmers' Register. It is presumed that the change will not be objected to, as it operates greatly to extend the circulation of advertisements.

TO CORRESPONDENTS.

Communications received too late for this No.—Extracts from Commodore Jones' farming "log-book," &c.—"Economy and usefulness of a tow-steamer, &c."—"Remarks on making wine."

TO SUBSCRIBERS.

☞ Some old subscribers, who reside at very remote places, have complained that the limit of two months for the privilege offered in Art. III. of the Conditions, had nearly expired before they received the No. 12 of last vol, which presented it. Therefore, and to allow every facility that can be desired by any one, the limit is now extended to the issue of the 4th No. (as stated below.

It is hoped that those who feel an interest in the prosperity of this work, and who choose to avail of the benefit offered, whether old or new subscribers, will not confine their action to sending *merely one* additional new name; but that each will send as many as his opportunities may permit. So *far*, we have no reason to regret having incurred the hazard of the experiment. If even but a few hundreds of the existing subscribers would aid the object by their individual influence in making known the plan and terms of this publication, it may be easily and permanently established as the *cheapest* work ever issued in the southern states.

CONDITIONS

OF

The Farmers' Register,

For Vol. VII. Prices still more reduced, for punctual or advanced payments.

I. The Farmers' Register is published in monthly numbers, of 64 large octavo pages each, and neatly covered, at $5 a year, payable in advance. Or, for $5 may be had *two copies* of the same current or forthcoming volume, for *new subscribers*, if so ordered and paid for in advance, (or at the time of making the subscription,) in current money, (as described below,) and without loss or deduction for postage, or any other charge to the publisher.

II. Subscribers now on the list, who have already paid the regular subscription price of $5 in the manner above required, for a single copy, shall have the privilege, upon sending a *post-paid* order, of having a second copy of the same volume sent to any NEW subscriber, without further charge, for that volume.

III. A like privilege will be allowed to every old subscriber who has not yet paid, but who shall do so, as above, before the issue of the 4th number of the 7th volume; thus in effect REDUCING TO HALF PRICE THE COST OF THE WORK TO EVERY SUBSCRIBER, OLD OR NEW, WHO MAY CHOOSE TO AVAIL OF THE OFFER.

IV. If, however, no more than one copy is ordered, the subscription price will still be, as heretofore, $5 the volume; as it is not designed to permit any subscription debt, or payment, to be made for less than $5. And if an order is sent for two copies, without compliance with the conditions annexed, only one will be sent.

V. The price of back volumes, as heretofore, is $5 for one alone, $10 for any three together, and in the same proportion ($3.34 cents for each,) for any number of volumes, except vol. I., which is at $6, and to be furnished only as part of a full set.

VI. ALL MAIL PAYMENTS MUST BE MADE IN NOTES, OR CHECKS, OF PAR VALUE IN VIRGINIA, or of a CITY and SPECIE-PAYING bank of the state in which the subscriber resides.

VII. The risk of loss of payments for subscriptions, sent free of postage, which have been properly committed to the mail, or to the hands of a postmaster, is assumed by the editor.

VIII. All letters to the editor in regard to the Farmers' Register must be post-paid—except such as contain articles for publication.

IX. If a subscription is not directed to be discontinued before the first number of the next volume has been published, it will be taken as a continuance for another year. Subscriptions must commence with the beginning of some one volume, and will not be taken for less than a year's publication.

X. The mutual obligations of the publisher and subscriber, for the year, are fully incurred as soon as the first number of the volume is issued; and after that time, no discontinuance of a subscription will be permitted. Nor will a subscription be discontinued for any earlier notice, while any thing thereon remains due, unless at the option of the editor.

IMPROVED CALF.

I have for sale a full bred *Bull Calf*, calved 12th March, 1838, three-fourths *Durham*, from Col. Powell's best stock, and one-fourth *Devon*, from the genuine Devon of Messrs. Caton & Patterson, of Baltimore.

Also, some half and five-eighths Heifers. Personal application, or letters post-paid, addressed to me, at Stevensville, King & Queen, Virginia, will receive attention from JAMES C. ROY.

Jan. 14—1A & 1R

DURHAM CATTLE FOR SALE.

The subscriber offers for sale a full bred Durham bull, six years old this month, bred by John H. Powell (near Philadelphia,) and equal to any he ever raised. His pedigree is in my possession, and may be seen by any one wishing to purchase.

ALSO,

A bull calf of three-fourths blood, and two cow calves, one of seven-eighths and the other of three-fourths. WINTER BRAY.

Near Tappahannock, Essex, Va.

Feb. 28th, 1839.—R3t.

FOR SALE BY

BRAGGS & THOMAS,

SILK-WORMS' EGGS,

Raised in this neighborhood, and of unquestionable good quality.

Petersburg, Feb. 1—R3t&A3t

THE FARMERS' REGISTER.

VOL. VII. MARCH 31, 1839. No. 3.

EDMUND RUFFIN, EDITOR AND PROPRIETOR.

ON THE BREEDING OF LIVE-STOCK,

AND ON THE COMPARATIVE INFLUENCE OF THE MALE AND FEMALE PARENTS IN IMPRESSING THE OFFSPRING.

(Concluded from page 123.)

I have thus produced facts of the influence of the male on the progeny in the horse, the cow, the sheep, and the sow, and in all I have endeavored to show to the society, that, whether that parent be the high bred one or not—whether to improve or to deteriorate—it is the *male* which has by far the greatest influence over the offspring. I would still quote one fact more, which has come under my own eye; it is in the common fowl. In the year 1810, I procured a breed of the Malay or Chittagong fowls, and those I crossed once or twice with cocks of the same breed, got from different quarters. In spring, 1824, they had been bred from cocks reared at home for three or four years, and were then all dark colored, without a white feather, having either black or yellow legs. Most of them resembled a partridge. At this time I learned there was in a farmer's possession a breed of fine Malays, which his brother (a surgeon on board an Indiaman,) had brought home. I sent and purchased one. He was what cock-fighters termed "pied," or in other words, had numerous white feathers all over his body, with white legs. From this cock were bred, in summer 1824, about seventy-eight chicks, of which number seventy-three were either pied or had a great deal of white on them; and a great proportion of them had white legs. Nothing but the influence of the male parents could have done this, for the hens were all gallant hens, not a white feather was to be found amongst them; nor could it have been owing to their ancestors, for they had all pedigree as long as Sir Watkin Williams Wynne.

Thus far have I stated facts which are known to myself and friends only; I would now mention some which are within the reach of all. Let us call to mind the offspring from the mare and the jackass. Is it not obvious to all the influence the male parent has on the mule? Color, shape of head, ears, and whole body, constitution, even temper, are all derived from the male parent. I had an opportunity of observing the very same effects in the colt from a quagga and a mare, in the possession of the Earl of Morton, at Dalmahoy. And his lordship, I believe, observed that the same mare, afterwards covered by a horse, retained in the progeny a resemblance to the quagga,[*] a fact of the most extraordinary nature.[†] I have been frequently told that a mule got by a horse, with the female ass, is a far superior animal, and retains the mane, with the ears much less, &c.; but this is a fact I never could get to the bottom of. I only know it is believed by the Spaniards.[‡] Nothing can be more striking than the power of the male in birds. It is well known that bird fanciers, as they are called, put a cock goldfinch to a hen canary, and that way get a strong, beautiful male-bird, having the greater part in plumage, song, and total appearance of the goldfinch, and showing, to the most trivial observer, that the male had the greatest influence in the progeny. Every one knows that the hen of any bird will lay eggs although no male be permitted to come near her; and that those eggs are only wanting in the vital principle which the impregnation of the male conveys to them. Here, then, we see the female able to make an egg, with yolk and white, shell and every part, just as it ought to be, so that we might, at the first glance, suppose that here, at all events, the female has the greatest influence. But see the change which the male produces. Put a bantam cock to a large-sized hen, and she will instantly lay a small egg; the chick will be short in the leg, have feathers to the foot, and put on the appearance of the cock; so that it is a frequent complaint where bantams are kept, that they make the hens lay small eggs and spoil the breed. Reverse the case; put a large dung-hill cock to bantam hens, and instantly they will lay larger eggs, and the chicks will be good sized birds, and the bantam will have nearly disappeared. Here, then, are a number of facts known to every one, or at least open to be known by every one, clearly proving the influence of the male in some animals; and as I hold it to be an axiom that nature never acts by contraries—never outrages the law clearly fixed in one species, by adopting the opposite course in another—therefore, as in the case of an equilateral triangle, on the length of one side being given, we can, with certainty, demonstrate that of the remaining; so, having found these laws to exist in one race of animals, we are entitled to assume that every species is subjected to the self-same rules—the whole bearing, in fact, the same relation to each other as the radii of a circle.

Now, then, to the point of expediency. Let us suppose that I have formed an erroneous opinion, and that other essayists bring forward counter-proof, to show the power of the female. What difficulties arise in changing the whole females on an extensive farm, while, with what ease a new male is procured! Sir John Sebright says, "Many females throw progeny unlike themselves, and it would be wise to try them with a male whose stock is known previous to breeding from them." How should we manage if we found it necessary from this cause, to put away a set of females, which we had procured from a great distance, for the very purpose of improving our breed? If proof were required in a thing so plain to common sense, the enormous prices given for males in comparison of females, would show the advantage of getting that sex which can give the breeder a hundred of his offspring in a season in place of one. Another advantage is the letting out the males to hire for the season, a thing greatly to be wished the soceity would encourage, and give premiums for. The system is productive of the best consequences, a few of which it may be well to bring before the society; and be it remembered that it is only by the male, for a thousand obvious reasons, that it can be done. When a person has bred or purchased a male, he not only does not like to put him away, although he perhaps has found out that he is not well calculated, either as to cross or selection, to suit the females he has to put him to; but from the partiality which we all have for our own, it is ten to one but we think an animal, which, in truth, is of no value, to be a very fine one; and thus the breeder patters on with an inferior animal, instead of year by year selecting such a male for hire as he sees would be best suited to correct the faults of his stock. Look to the good arising in our breed of horses from this system, which in fact public stallions exemplify. Look how the districts in England, where the practice of letting bulls and rams of by the season exists, have far outstripped the rest the island in the excellence of the stock which they possess; and let any one say if the benefit resulting from it is not self-evident. If such a thing were to be introduced in Scotland, and I shall hope one day to see it introduced under the patronage of the Highland Society, it ought decidedly to be in the shape of shows or competitions. Then a spirited farmer, or a few neighbors, could join and procure a fine animal at an easy rate: then the ignorant pretending judge would be told the truth by the verdict passed on his property by the public, who would not spare either his veracity or self-conceit; comparison would teach all a better taste and judgment; fine animals would be brought from England, and all parts of the country; and rewards, not only of fame, but of emolument, would be conferred on the man who paid the greatest attention to his trade, and consequently brought foward the finest animals. I do not think I can better conclude than by quoting the words of Sir John Sebright, whose ideas on the subject altogether coincide with my own. "There is, perhaps," says he, "no means by which the breed of animals can be so rapidly and so effectually improved, as by its being the particular business of some breeders to provide MALE *animals* for the purpose of letting to hire. No trouble or expense will be spared by those who expect to derive profit, not from the quantity but from the quality of the animals which they breed; the competition which must always exist between breeders of this description will be a never-failing stimulus to exertion. The common farmer, who seldom sees any stock but his own or that of his neighbors, generally concludes that his have arrived at the summit of perfection. But the breeder, who lets for hire, must frequently submit his own male animals to the inspection of the public, and to the criticism of his rivals, who will certainly not encourage any prejudices he may entertain of their superiority. Thus each, besides the improvement of his stock, will receive a fair remuneration; and every breeder have the means of selecting the male he thinks best calculated for the females he may happen to possess."

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[*] The quagga is the species which links the zebra and the ass.

[†] An account of the circumstance alluded to by the author is given by the late Lord Morton, in the Phil. Trans. for 1821, p. 21.—(EDIT.)

[‡] If a mule be remarked in Spain as particularly neat and handsome, the muleteer will always say, "Si, *signor, caballo estavo, padre*." Yes, sir, a horse was his father.

I have now, I humbly conceive, shown not only that it is the male parent which is capable of most speedily improving the breed of live stock, connected with agriculture, but that *the male is the parent*, from motives of sense and sound policy, which we can alone look to for the improvement of our breed of live-stock.

From the Farmers' Cabinet.

ICE-HOUSES.

In your July No. the question is asked, "who will answer to the request of a subscriber to be informed of the best plan of building ice-houses, the most suitable situation, &c. &c.?" As my experience upon this subject has been considerable, and differs, in some respects, from that communicated for the Cabinet in some of the succeeding numbers, I beg leave to trouble you with it, though at this late day; and ask the favor of a publication, if you shall believe there is in the premises any information conveyed worth the expense of printing.

The first great secret in constructing an ice-house, which will preserve the ice until the succeeding winter, consists in making it of considerable capacity; to contain from 80 to 100 full ox-cart loads. The next is, that it should be under ground, and in a porous soil. If this last cannot be obtained, the inconvenience may be obviated, where the location will admit of it, by a tortuous drain from the bottom, so constructed as to permit the passage of the water from the dissolving ice without admitting the introduction of the warm external air; or in a comparatively level situation, by sinking a well in the centre, deep enough to reach a porous soil; or, if this cannot be reached easily, of capacity sufficient to contain eight or ten hogsheads of water, and in both cases *walled* and not *filled up* with stone. The bottom of the pit may be so constructed as to have a fall from the whole circumference to this centre.

My ice-house is a pit eighteen feet square, and twelve feet deep, walled up with stone as an ordinary cellar—the wall eighteen inches thick, and continued one foot above the ground—the roof of shingles, and the ends boarded up with the space of an inch between each board, to admit a free ventilation. I fill it in the following manner. When there comes a good snow which *drifts* a good deal, I collect three or four ox-carts and half a dozen hands, and chosing a *drift* which has blown from a *grass-field*, the snow is cut with a shovel or spade into blocks of a size to be handled with facility, loaded into the carts, which are backed up to the door of the ice-house and tilted in. The business of one hand is to remain in the ice-house and tramp the snow *well* and *evenly* down. When the snow is in good condition, that is, when it is drifted into high banks, and thereby rendered solid, the filling is executed with great facility, economy and celerity. In the winter of 1837, my ice-house was filled to the comb of the roof in one day and a quarter, by seven hands and two ox-carts. The drift was within 150 yards of the ice-house. In the winter of 1838 I filled the same house in one day and a half by five hands and three ox-carts. This snow was not drifted. It was the last of March, and the prospect of getting drift snow had failed. It was a wet snow. I had it rolled into large balls on one day, and on the next, when the water had pretty well drained out of it, it was put into carts and emptied into the ice-house. In the latter mode when the snow is wet enough to be rolled into balls with facility, the filling is executed with more expedition, and packing very close in the house, it does not dissolve so much as the driven snow. I have filled my ice-house with driven snow so white and clean, as to be used with equal gust in all modes in which ice is used; but when rolled into balls, even on grass-lands, it contracts impurities from the surface, from which it cannot be freed, which render it unfit for some few of the purposes for which ice is used. For the preservation of fresh meat, &c., and for the making of ice-creams, snow is preferable to ice, for an obvious reason; while for almost all other purposes it may be used with almost equal comfort and advantage. Snow is water converted into vapor, exhaled, free from all impurities; and frozen in the clouds, descends to us, and is an appropriate and beautiful, as just emblem of the highest moral purity. Ice is water congealed, with all its impurities, and these are not a few, and what is of more consequence, the most nauseous of them are invisible; at least this is the character of the water from which the ice is obtained, from which most ice-houses are filled. The filling an ice-house with *ice*, is, to most persons in the country, even when there is a stream convenient, and a pond even without the expense of constructing one, a job so laborious, expensive, disagreeable, and unhealthy to those actively engaged in its operations, that I have no doubt many are kept from the enjoyment of this wholesome (when pure,) and grateful luxury by these considerations alone. And why should this be so, since an ice-house filled with *drifted* snow, or snow wet enough to be rolled into *large balls, and left for twelve hours to drain before being put into the ice-house*, affords all the comforts, advantages and luxuries which can be derived from one filled with ice. Add to this, the cost of the former, it does not exceed $10, and may be executed in dry and mild weather, and exposes to no disease; whereas, if filled with ice, the work must be done while the weather is very cold; or if the ice be dissolving, it is not so good, and greatly exposes to disease those who are employed in the operation, and costs four times as much.

My ice-house is walled with stone. I fill it without placing any material betweens the wall and the snow. As soon as it is filled, and the ice sunken sufficiently for that purpose, which will be the first few days of thawing weather, I cover it well with wheat straw, say two or three feet thick, and as it begins to separate from the wall I push the srtaw down as far as it can be got, and occasionally do this during the summer. My ice-house frequently has snow in it when the season comes round for filling it.

ROBERT H. ARCHER.

Churchville, Harford, county, Md.

From the Farmers' Cabinet.

LIME.

Mr. Editor,—Your Cabinet, which is even now, I believe, the best publication on farming in this country, might be rendered more generally useful, I am sure, if your correspondents (who are numerous and able,) would always state the grounds on which they form their opinions. Advice, unsupported by example, is seldom followed; nor is the fact that the persons who give it most frequently use fictitious names, any incentive to its adoption, especially as the statements and conclusions made by them, however true, often appear ridiculous and absurd. If your contributors would all substantiate their statements, (by a relation) as I have intimated before, of the facts and experiments on which they are founded, and give toe their names and residences, so that people may know on whom they depend, a very great stumbling block to the usefulness of your paper would be removed.

These reflections were produced by the singular circumstance, that although the Farmers' Cabinet abounds with testimony in favor of using lime, yet in this vicinity there are very few indeed who have been prevailed upon by it to give this invaluable manure a trial.

Now, Mr. Editor, if you think the following extract from my journal (free at least from the above objection) will have any tendency to arouse the people of this section of country to their own interest, you are requested to give it a place in your periodical.

In the spring of 1835, I planted a field containing twenty-five acres of land in corn; this field was a light and sandy soil, and had been in corn, oats, and pasture, without any admixture of clover, or manure, successively for a number of years; four hundred and seventy-five bushels of corn was received from this field this season, which was considered an uncommon large crop; the following spring this field was sown in oats, which at harvest was in some places scarcely worth cutting; the following fall it was sown in wheat, and in the spring following I sowed it in clover; the result of the wheat crop was, that I did not receive as much as was sown, and thinking the clover not worth keeping for the scythe, it was pastured until fall.

Profiting by former experience, I now determined to apply lime to this field; accordingly in the spring (1838,) I had it well ploughed, and 800 bushels of stone-lime carefully spread upon twenty acres of the same. It was then harrowed well until in good order, after which it was struck out lightly four feet square for planting corn, which was done from the first to the fifth of May. (My reasons for adopting the above method, was that the land being poor, and having, the fall previous to liming, been manured, I thought, by flushing it in the spring, and spreading the lime on top and harrowing well would be the best plan to produce a good crop of corn, as well as to improve the land speedily; and I would observe that the corn was not cultivated so much as I wished, owing to a storm which knocked it about so as to render it impossible to continue cultivating it.) I was careful in leaving but two stalks in each hill. The corn on the twenty acrs, which had been limed suffered but little if any, from the severe drought which took place this season, but the corn on the five acres having no lime on, suffered very much. The corn was cut up and shocked in the month of September, and husked out and measured in November. The corn was very dry and good. The result of this crop was 743 bushels from the twenty acres which were limed, manured, &c. and 80 bushels from the five acres having no lime on, making in the whole 823 bushels of corn. It is the conviction of many farmers, that the corn crops this season would have been much larger, had not the drought taken place.

Let us now contrast this last crop of corn with the former one, and show the difference as to the land which was limed, manured, &c., and the land which was not, as the soil of this field was alike in quality previous to the above improvement.

	bus.
1835. Produce of twenty acres, 19 bushels per acre,	380
1838. Do. of 20 do. 37 do. do.	743
	363
Or, produce of the whole 25 acres in 1835,	475
1838. Do. of 20 acres, and 16 bushels per acre on 5 acres not limed, 80 bushels,	803
	328

Showing a difference between the former and the last crop, from 20 acres, of three hundred and forty-three bushels; and a difference between the former crop from the whole field, and the last crop, of three hundred and twenty-eight bushels.

It will appear then, Mr. Editor, that I have received this season 363 bushels of corn more from twenty acres of this field than the former crop, which was received from the same twenty acres. Or, taking in the five acres which had no lime on, I received an overplus this season of 328 bushels, there being that number of bushels of corn from the field, more than at the former crop.

We will now make some estimate as to the cost of the lime, and I think it costs nothing to those who use it judiciously upon their land. We will take into this estimate the overplus corn from the twenty acres of land which was limed, the overplus of which is 363 bushels.

Land (twenty acres)	*Dr.*
1838. May 1. To am't paid for 800 bushels of lime delivered,	$200 00
To spreading lime, &c.	8 00
Nov. Interest on the money, 7 mo.	7 00
	215 00
Supra,	*Cr.*
By 363 bushels of corn at 75 cts.	$272 25
By balance remaining on overplus corn,	$57 25

Thus it will appear, that after paying for the lime, and for carting and spreading it, and allowing the interest on the money paid, there still remains a balance from the overplus corn the sum of $57 25, which will amply pay for all extra labor and expense that the raising of this overplus of corn may be charged with. If such then is the case, which is to me as clear as that two and two make four, how is it that lime "*costs too much*," which appears to be the hobby-horse upon which too many land-holders in our neighborhood ride upon; and for which reason it is not used upon their lands. There are few individuals here who have lately given it a trial, and they have been fully satisfied as to the powerful effects of this invaluable mineral upon their land; and I hope that the time is not far distant when many of our land-holders in this neighboorhood will give it a trial. We shall not then fear but what our section of country will advance too in the march of improvement.

R. M. Black.

Pencader Hun., N. Castle Co., Del., Dec. 25, 1838.

From the Silk Culturist.

EXHIBIT OF THE VALUE OF SILKS, IMPORTED INTO THE UNITED STATES, AND EXPORTED, FROM 1821 TO 1837 INCLUSIVE.

Year.	Silks.	
	Imported.	Exported.
1821	$4,486,924	$1,057,243
1822	6,840,928	1,016,262
1823	6,718,444	1,512,449
1824	7,204,588	1,816,325
1825	10,299,743	2,590,381
1826	8,327,909	3,367,015
1827	6,712,015	1,871,276
1828	7,686,640	1,270,461
1829	7,192,698	956,925
1830	5,932,243	1,061,054
1831	11,117,946	1,186,129
1832	9,248,907	1,337,073
1833	9,496,366	1,332,872
1834	10,998,964	1,036,057
1835	16,677,547	758,900
1836	22,980,212	762,730
1837	14,352,823	1,207,802

T. L. Smith, *Register.*

Treasury Department,
Register's Office, *Aug.* 31, 1838.

From the Franklin Farmer.

THE SHORT-HORN FEVER IN KENTUCKY.

The Cultivator and Genesee Farmer were prophecying a short time ago, that the cattle fever in the west would soon reach a crisis. Those who are gifted with the spirit of prophecy never fail to find the facts which verify their predictions; and accordingly, the last number of the Cultivator, in noticing the price of a cow which was lately sold for $2000 in Kentucky, announces, that "this *is* the climax." The fever, having reached its crisis, according to the opinion of the Cultivator, we wonder that paper had not advised its readers whether the patient would die or get well. Judge Buel is unquestionably an excellent farmer and writer, but clearly he is *no doctor;* and if he were, he could not feel the pulse of a patient, at his distance, from Kentucky. But if our worthy cotemporary will honor our state by a visit, we promise to accompany him to the farm of every prominent breeder, and he will then be able to study and learn the true pathology of this disease, which at a distance, appears so frightful. We will point him to the glorious blue-grass pastures, and the immense fields of "meal, meadow and manure," abounding in Kentucky; we will show him estimates of the exports of live-stock from Kentucky to every quarter of the vast south; we will prove to him the great demand for improved animals of any discription, not only existing in Kentucky, but the whole valley of the Mississippi, and which cannot be met; we will point him to the spirit which is exhibited here of substituting superior for inferior stock, and to the willingness of paying at present a comparatively high price in view of the vast advantage which must ultimately result from rearing good animals, instead of bad ones; and we think he will ackowledge that these are undoubtedly some of the predisposing causes of this great malady. Will you come, Judge?—We promise you shall graduate before you return to the north.

The "*climax*," however, we think, is not yet attained in Kentucky. The gentlemen who paid $2000 for a cow, have refused an advance on that price for her. One half of the $2000 cow and calf has been lately purchased by the owner of the other half, at an advance on cost. We do not pretend to say that higher prices than these will hereafter be given, for the animals to which we have alluded, are considered extra superior; but we are confident that the present current rates will be sustained for some time to come. There is not the least symptom of that *decline* which invariably follows a "*climax*." In saying this, however, we do not wish to be understood as advocating the propriety of every farmer's giving these enormous prices. For the good of the breeding interest, and in view of the more rapid and general spread of the Durham cattle, we wish they could be sold at prices that would justify every farmer in substituting them for inferior breeds of the country. Purchasers can in general, buy Durham cattle in Kentucy as low, if not lower, than they can get animals of equal quality in England, and hence the present current rates will not probably decline very shortly. But we should rejoice to announce such a decline as would enable all to purchase; although we think those enterprising pioneers who have risked so much money in introducing them into the country, ought to be amply remunerated. We learn that several individuals and companies in Kentucky, having heavy capital, have gone or sent agents to England to purchase more improved stock of every discription; and this at a time too, when, it is understood, the price of superior cattle has advanced fifty per cent in that country.

From the Genesee Farmer.

ELECTRO-MAGNETIC POWER.

In a late number of the Genesee Farmer, an inquiry was made as to the state of Davenport's electro-magnetic machines, and the probability of their affording a power capable of working thrashing machines of the kind noticed by the inquirer, as well as affording power for other purposes. To this inquiry we can only say, that nothing more is known of the state of Mr. Davenport's machines, than that he has for some months been at work upon one which it is hoped will justify the anticipations he and his friends appear to entertain of it as a moving power. At the same time, it may be remarked, that the experiments of others, if not of Mr. D., would seem to lead to the supposition, that the increase of power is not in proportion to the increase of size in the machines; and Dr. Page of Washington, who has tried various combinations of this power, and carefully watched the results, is of the opinion that it cannot be made applicable for the purposes requiring great power, or such as now require steam, or at least that a single machine cannot be made to exert such a power. Dr. Page's conclusion may be correct, so far as regards the working of a single machine; but we think he has himself furnished evidence, that any required degree of power may be obtained by a combination of small machines. In Silliman's Journal for January, 1839, is a paper on this subject by Dr. Page, in the course of which there is a drawing and description of a machine made by Mr. Davis, of Boston, of which Dr. Page says—"As a proof that electro-magnetism is susceptible of useful application where only a small power is wanted, a small engine was made by Mr. Davis in the month of July last, by the aid of which an individual gains fifteen dollars per day, by the simple operation of drilling the steel-plates for gas burners. I think this may be considered the first instance in which the mechanical application of electro-magnetism has been turned to profitable account." It appears perfectly evident to us, that a combination of the power of several such machines, like that of several boilers on a single steam-engine, may be made to exert almost any power wanted; whether the expense would be justified in the result, can only be determined when the nature and efficiency of this new agent is better understood. As it is, we must for a time be content with the old fashioned agents, horse, water or steam-power, and patiently wait for other developments and improvements.

From the Farmers' Cabinet.

THE SUGAR BEET AND THE RUTA BAGA.

Although the gentlemen who formed the "Sugar Beet Society," and introduced the seed among us, have not as yet seen their hopes realized by the establishment of sugar manufactories in Pennsylvania, yet they are entitled to the gratitude of our farmers for introducing to their notice an article which must, I think, ere long, be placed at the head of our list of root-crops, as cultivated expressly for the winter food of our stock. I am aware of the preference given by different root-growers to the carrot, the ruta baga, and the beet, and that preconceived opinion often prevents a fair trial of the merits of other roots.

I have the past season cultivated the beet and ruta baga, and were either one out of reach, I should rest satisfied with the other as one of the greatest luxuries for our cattle during the winter, and a rich mine from which to increase the quantity of manure, and consequently the crops to which manure is applied; I cultivated both, in order to arrive, by experiment, at some conclusion as to their relative value; the season has been unpropitious for all root crops, it is said; as for me, I cannot complain; one sixteenth of an acre planted with beets without manure, (but in a deep rich soil,) twice ploughed, and four times harrowed, gave 65 bushels; at the rate of 1,040 bushels per acre. One fourth of an acre of ruta baga on an inferior piece of ground on which was put three two-horse loads of manure, twice ploughed and three times harrowed, gave 120 bushels; equal to 480 bushels per acre.

The beets had a fair chance; it was nothing but straight-forward work with them from planting until gathering time; but the poor ruta bagas had up-hill work for six weeks at the beginning; the drought, the grass-hopper and the turnip flea, did their work so effectually that I abandoned the crop in despair; however, when the rains came on, many seeds which had lain in the earth vegetated and grew so luxuriantly as to give the above result, where every one who saw the ground predicted there would not be five bushels; with a fair chance, I firmly believe, my quarter acre would have yielded 250 bushels.

As to the relative value of the rival crops, I cannot say any thing with accuracy farther than that when our stock of beets was exhausted, and we commenced feeding the ruta bagas, although I have not been able to detect any difference in the *quantity of milk* in the pails, the *quantity of butter on the second week of turnip feed was reduced one-third*, at which point it still continues; the quality is about the same.

I have no other facts in possession which will warrant me in giving the beet the preference. The cattle eat the turnips with the same eagerness as the beets, and present the same healthy appearance. The horses and store-hogs I find give preference to the beet, the sheep to the turnip, and all the fault I have to find is with myself for not raising enough to let the above mentioned worthies comes in with the cattle for their daily rations of roots. Others have no doubt dipt into this subject more deeply than I have, and are consequently much better qualified from experience and longer observation to arrive at more positive conclusions; will they let us hear from them?

MAHLON S. KIRKBRIDE.

Morrisville, Jan. 15th, 1839.

From the Farmers' Cabinet.

ON THE PREPARATION OF ORCHARD GRASS-SEED FOR SOWING

Orchard grass-seed is always in the hull or chaff, and is very light, not weighing more than 12 or 14 lbs. per bushel, and if sown without being first wetted, it is very liable to fail though the seed be ever so good. It is recommended to spread it out on the floor, and with a watering pot to sprinkle it, and then mix it well with a rake, and then let it lay till the next day, when if necessary, it may be again sprinkled with water, and mixed up well; and before sowing it, mix plaster-of-Paris with it to bring it to a proper state for sowing. The water and plaster will increase the weight, and cause it to settle close to the ground and enable it to take root. This is one of our most valuable and profitable grasses, and every care ought to be taken in sowing it properly, for on this depends the success of the crop. It is generally sown much too thin; two bushels to the acre is preferable to one by just one half. Remember that whatever is worth doing at all is worth doing well. R.

From the Hampshire Gazette.

EXCAVATING BY STEAM.

In excavating for the rail-road near Springfield, a machine is made use of, which is operated by steam-power. Similar machines are also used in other places on the road. The machinery of this machine, which we are not able to describe, is contained in a small building about the size of an Irish hut, which is placed on wheels, and can be moved as necessity requires. The *scoop, or scraper*, (we are ignorant of the proper name of it,) is something like a coal-hod, with one edge sharp, and containing three or four large teeth. A huge bail is attached to the mouth of the scraper, to which is connected a chain that passes over a pully at the extremity of a projecting crane, and communicates with the machinery within the building; the other end of the scraper is united to a beam, or lever, which passes under the crane. The scraper is let down to the bottom of the excavation, the mouth of it sustaining a downward inclination, and is thus drawn up through the gravel by the chain attached to the bail, and filled. It is then swung off by means of the crane, over a gravel car, the bottom removed by a jerk upon a cord, and the contents discharged. Each scraper fills a car full, and every operation occupies about a minute. It is said to excavate as rapidly as 25 men—making a saving of about 20 men. It can be used to advantage, we presume, only in rather light soils.

The Irish view it with a jealous eye, and it is necessary to guard it constantly to prevent their destroying it. They are not pleased with so powerful a competitor.

From the Maine Farmer.

CARE OF COWS.

Some farmers are particular to have their oxen and horses well tended and well fed, but pay no attention to their cows. This is one of the errors which ought to be corrected. Cows that give milk should have a warm barn, the best hay and a feeding of roots every day, and the extra milk will doubly remunerate the trouble and expense. And cows that are dry, and expected to calve in the spring, should certainly be carefully tended and warmly housed to keep them in flesh and prevent them from contracting any disease which will be likely to affect them after they have calved. Cattle are as liable to take cold from exposure as men are, and by paying a little attention to their comfort you may save them a great deal of suffering, and yourself much loss. A great portion of the accidents which happen to young cows with their first calf, are owing to poor keeping, exposure to cold or some accident during the winter, the effect of which is not manifested until after they have dropped the calf. A mess of raw potatoes and a little salt regularly given once or twice a week to cows that will calve early, is very beneficial. It will keep their hide loose and have a tendency to produce a healthy action throughout the whole system.

While on this subject, there is one practice more we will name which is followed by some farmers, that ought to be abandoned. This is the practice of putting the hay over into the crib immediately under their cattle's noses. In this case they necessarily breath on it, and then will not eat it. A board from the bottom of the partition that separates the "tie-up" from the barn floor, should be removed, and the hay placed against the aperture within their reach. By feeding in this way you can give them as much as they will eat, and they will make no orts.

From Arthur Young's Travels in France, (in 1787, '88, '89.)

ON THE CULTURE OF SILK IN FRANCE.

QUERCY.—*Caussade.*—In the avenue leading to this town, two rows of the trees are mulberries, and these are the first we have seen.

Montauban.—Many mulberries here, in rows; and under some of them four rows of vines, and then six or seven times the breadth of corn. When the leaves are not in time for the worms, or are destroyed by frosts, they are fed with lettuce leaves; and if no lettuce, with cabbage; but the silk is so worthless, that the failure is reckoned nearly equal to having none at all.

Toulouse to Noé.—Mulberry trees are here worth from 6 *sous* to 20 *sous*, and 30 *sous* each, per annum, according to their size.

Noé.—Mulberries worth up to 3 *livres* per tree, per annum. But silk worms have missed much for three years past.

Norbonne.—Many mulberries; all with pruned flat heads.

Pinjean.—Olives are a beneficial article of culture, but they prefer mulberries, because they yield a crop every year. On four *sétérées* of land they have sixty trees; and at the same time the land yields barley or oats, mown for forage, of which the four *sétérées* gives 60 quintals, that sell at 33 *sous* the quintal. Single mulberries have paid as far as two *louis* each, and many one *louis*. If four *sétérées* equal two acres, there are thirty trees on an acre, and the acreable produce of forage will be 52 *livres*, or 2£, 5s, 6d.

Nismes to Sauve.—Seven mulberries on an English rood.

Quésac.—Mulberry leaves sell commonly at 3 *livres* the quintal. A tree yields from one to eleven quintals: two, three, and four are common. Gathering the leaves cost 12 *sous* the quintal. Fifteen quintals of leaves are necessary for one ounce of *grain*, [the seed or eggs of the worm]: 20 *livres* the mean price of silk per lb.: reckon that an olive tree pays as well as a mulberry.

Many mulberries about Quésac, and some on very poor dry land. In grass-fields the ground is kept dug around them, as far as the branches extend. Remark some stones laid around many trees, for some distance from the stem.

Eight trees in something less than an English rood.

By information, almonds, in Rouverge, pay better than mulberries, and with much less expense and attention; 3, 4, 5, and 6 *livres* a tree.

Gange.—Many fine mulberries about this place, which yield from 3 *livres* to 8 *livres* a tree in common, young ones excluded. They yield to twelve quintals of leaves; in general, three, four, or five. The price varies from 3 *livres* to 10 *livres* the quintal. They are much more valuable than olives. This year the great cold in April destroyed the young buds and hurt the crop greatly. They never think of giving any thing to worms but the leaves; have heard of twenty things, but treat the idea with the greatest contempt, knowing as they do, by the fabric, the worthlessness of silk, if the worms are so fed.

Lodeve.—Mulberries are more profitable than olives; yield three, four, and five quintals of leaves, which sell, in common, at 3 *livres*.

Mirepoix.—Mulberries are here, but none after, in going from Carcassonne to St. Martory.

Auch.—A few mulberries near the town.

It is here to be noted, that from Mirepoix to Bagnere de Luchon, and from thence by Pau to Bayonne, and back by Dax to Auch, a line of much more than 300 miles, I saw no mulberry trees.

GUIENNE.—*Leyrac.*—Some few mulberries.

Aiguillon.—A few trees for some miles before this place. Behind the chateau, in the town, is a large plantation, formed by the late duke; which, being in the fine vale of the Garonne, the land is cultivated as the rest, under hemp and wheat; but both those crops are less than middling, the expression of the person who gave us the information, on account of the roots and shade of the trees. The duke gives the leaves to the people in the town, furnishing also the wood, boards, grain, and whatever else is necessary for the business, and has in return the third part of the silk they make. Every one in the place, and all round the country, say that he loses considerably by it; asserting, that the land thus occupied is worth 500 *louis* a year; that the crop of silk is so precarious that he has had eight quintals, and in other years only three, two, and even one; so that on an average, his third part gives only 150 *louis*, and the crops under the trees cannot make up one-half of the deficiency. They also maintain, that the land is too rich for mulberries; and, to prove that they are right in their ideas, they quoted many gentlemen in the neighborhood, who have grubbed up their mulberries.*

Tours.—They have in the neighborhood of this city many mulberries, insomuch, that the value of the raw silk has amounted, as they assert, in a good year, to a million of *livres*. I walked several times into the country to view the trees and make inquiries. Many of the corn-fields are regularly planted all over; the gardens are surrounded with them; and the roads and lanes have rows of them. The large good trees, in a favorable year, give to the value of 4 *livres*, but not in common. I viewed several plantations; containing old, young, good, and bad, that gave on an average, one with another, 30 *sous*, which seemed, from various accounts, to be a general medium; it, however, excludes very bad years; such, for instance, as last spring, in which they had no crop at all, the frosts in April (note, this is certainly one of the finest climates in France,) having entirely destroyed it. I saw several trees which gave to the amount of 10 to 15 *sous* at ten years old, and 30 *sous* at the age of fifteen years. Plants, at two years old, are sold at 3 *livres* the hundred: at three years old, 4 *livres*: and good trees, proper to plant out in an arable field, 20 *sous* each. In regard to the distance, at which the trees are planted, they have no general rule. I measured many distances, in a large corn [wheat] field, and found them at two rod square, at an average: in another, they were six yards by nine; which trees gave 40 *sous* on a medium: round a garden they were at five yards from tree to tree: a field, entirely cropped with mulberries, had them in rows at one and a half rod; and between the rows another of small plants, in the manner of a hedge. If sixty square yards are allowed per tree, there will be eighty on an acre, and if they give 30 *sous* each, it will amount to the vast produce of 5 *livres* per acre, besides what can be gained under them; it would, however be a question, whether this under-crop would make up for bad years, that yield nothing? Around field, in roads, corners, &c., the profit will be greater. It is remarkable, however, that with all this profit attending them, they do not increase about Tours; yet not one acre in a hundred adapted to the culture, is so employed, which shows either a very uncommon want of capital, or doubts whether the cultivation is so profitable as it appears to be from such information.

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* All the places before named, are in the southern extremity of France. Toulouse is as far south as the northern shore of the Mediterranean, near Montpellier. Tours, in Touraine, the next named place, is on the Loire, and about midway between the northern and southern extremities. Since Young's account was written, the mulberry plantations and silk-culture of Touraine have greatly diminished, as appears from an inquiry into the causes, instituted by the Royal and Central Agricultural Society of France, as published in the *Annales de l'Agriculture Francaise*, for 1834.—See page 257.—ED. FAR. REG.

In order to spread the cultivation, government established nurseries, and gave the trees gratis, until private nurseries were opened; and in winding the silk much assistance was also given, to the loss to government, of 20 *sous* per lb.; but now the business is carried on without any premium of that sort. Probably such encouragements were of very little use; the abuses incident to all governments would direct such assistance to be given where it was not wanted; and in that case it would, by raising disgust, do mischief.

They plant no mulberry but the white; the black they think very bad.

NORMANDIE.*—*Bizy.*—Having read, in the memoirs of some of the agricultural societies in France, that the marshal duke de Belleisle made a very considerable and successful experiment on the introduction of the culture of silk in Normandie, on his estate at Bizy, I had long ago made a note of it, for examining; as the steps which proved successful in such an attempt in Normandie, might probably have the same effect, if applied in a climate so similar as that of England. I went to Bizy with this view, and did what I could to find out the proper persons, concerned in this undertaking, to give me the information that was necessary.

Five-and-thirty years ago, the duke began by making some extensive plantations of mulberries, to the amount of many thousand trees: they succeeded well; and, in order to draw all the advantage possible from them, as the people in the neighborhood were ignorant and awkward in the process, the duke, by means of a friend in Provence, procured a man, his wife, and all his children, well skilled in the whole business of the silk-worm, and established them at Bizy, in order to instruct his own people in it. By these means, he made as much silk as the produce of leaves would admit. I wished to know to what amount, but could not ascertain it; but the duke continued his plantations of mulberries during nine or ten years. I tried hard to find out some descendant or remains of this Provencal family, but in vain; the man was dead, the woman gone, and the children dispersed; the estate, on the marshal's death, having been sold, and coming into the possession of the duke de Penthievre, made all these circumstances the more difficult. The great object was, the success of the experiment; this inquiry was uniformly answered by several persons:—it had no success at all. It was a favorite project of the duke's, and supported with perseverance, for many years, until his death; but the silk did not pay charges: and though he very liberally offered leaves to the poor people, on easier terms than they are supplied with them in the south of France, and even gave trees; yet nothing more was done than what his influence and authority forced: and the Provencal family, after ten years experience, pronounced that the climate would do to make silk, but not with profit. To his last hour the duke had silk made, but not an hour longer; the practice had taken no root: the country people, by whom alone such an undertaking could prosper, saw no inducement to go into the scheme, and the whole fell at once into utter ruin and neglect on the duke's death; so that the trees themselves were by degrees condemned, and the number remaining at present are inconsiderable. Certainly no positive physical proof that silk will not do in Normandy, but it is a presumptive one, pretty strongly featured. Go into Languedoc, Dauphiné, and Provence, and the poor people do not want the exertions of marshals of France to induce them to breed silk-worms; they have a much more powerful inducement—the experience that it is their interest: had this inducement been present at Bizy, the culture would, in more than ten years, have taken root.

BOURBONNOIS.*—*Moulins.*—Mons. Martin, gardener of the royal nursery here, who is from Languedoc, cultivates silk with great success; he was so obliging as to be as communicative as I could wish. Trees of two or three years old yield a few leaves, but to be stripped cautiously: at eight or ten years, they come very well into yielding. One ounce of *grain*, that is, of the eggs of the worms, requires twenty quintals [one hundred weight English] of leaves, and yields from 7 lb. to 9 lb. of silk. He has made as far as 300 lb. in a year, the produce of 3,000 lb. of cocoons; and the worms that year eat 12,000 lb. of leaves every day, for four or five days together, and fifty persons were employed for eight days. The whole business of hatching and feeding employs a month; the winding is afterwards done at leisure. For care and attendance of the worms, gathering the leaves, and winding the silk, he gives one-fourth of the produce, or about 6 *livres* the pound of silk; for spinning 3 *livres*; in all, 9 *livres*; rest profit, 15 *livres*. The men earn 20 to 24 *sous* a day, and the women 8 to 10 *sous*. He prefers this climate for the business to that of Languedoc, though stoves are here necessary for keeping the room to the temperature of 18 degrees, Reaumur; whereas in Languedoc they do without fires. The season here varies from fifteen to twenty days; the earliest is the 24th of April, and the latest the 15th of May. If the leaves are not ready, he keeps the hatching back, by lodging the *grains* in a cool cellar. He has known one tree in Languedoc yield 80 *livres* a year in silk. Moulins and its environs make to the value of 60 or 80,000 *livres* a year. Mons. Martin sells trees, of two years old, at 20 *livres* the thousand. The distance of planting, if for crops under the trees, thirty feet; if no crops, twenty feet. Of the writers that have treated of this subject, he prefers Mons. Sauvages.

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* Normandie—in the northern part of France, and on the southern coast of the English channel.—ED. F. R.

* Bourbonnois—east of the central part of France.

In the particulars of an estate to be sold, was one article relative to the product of silk; mulberries enough for 12 oz. of grain, yielding 60 lb. of silk.

VIVARAIS.[*]—*Maisse to Thuys.*—First meet with mulberries in going south from Auvergne. They yield very largely here; I am assured, that many trees, in a good year, reach 12 *livres* each. That in four years after planting, they begin to produce leaves enough for stripping. The best of them are all grafted. Trees, fifteen years after planting, have, in a very good year, yielded six *livres*. I was shewn a small field that yields, one year with another, 120 *livres;* I stepped, and found it 50 yards by 70 yards, or 3,500 square yards, (£7. 4*s*. 4*d*. per English acre); yet the trees were not regularly planted, nor fully; and this besides the other produce of the ground.

Aubenas.—The silk-mills here, which are considerable, purchase the cocoons of the farmer, at 28 to 32 *sous* the pound. The mulberry trees here are very large.

Villeneuve de Bergue.—Twenty quintals of leaves give one quintal of cocoons, and one quintal of cocoons 10 lb. of silk. They reckon that the waste, *débris* and *dechet*, pay the spinning. Eighteen trees, of seven years age, pay 28 *livres* a year; but some trees, of ten years old, have been known to give 3 *livres* each. Three-fourths of an arpent *de Paris* have been sold for 400 *livres;* the soil all rock and stone, but calcareous. The trees are grafted before transplantation, which is at three years old; price, 12 and 15 *sous* each. The second year after planting they begin to gather. The price of the leaves 3 *livres* the 100 lb.; and of gathering 10 *sous* the quintal. The culture is reckoned more profitable than vines, which are sometimes grubbed up, to make way for mulberries. Of the sorts, the *rose feuille* is best. In the road to Viviers, I remarked a tree 2½ feet in diameter; and very large ones are in the bed of a torrent, where no earth (only stones) is visible.

DAUPHINE.[†]—*Montélimart.*—Silk is the great produce of the country; they have mills, where the cocoons are bought, at 27 *sous* the pound. An ounce of *grains* gives 60 lb. of cocoons, and 12 lb. of cocoons 1 lb. of silk: forty middling trees, each yielding a quintal of leaves, being required to feed that proportion of worms. The *grains* are hatched by artificial heat, and the operation demands wood to the amount of 24 *livres* to each ounce of grains. A common method of conducting the business is, for the proprietor of the land to find trees and half the *grains*, the poor people the other half and all the labor; and the parties divide the produce between them. The impediments in the culture are,—1. climate; frosts in the spring destroy the leaves, and, if at a critical time, there is no remedy. I demanded if they had no succedaneum, in such case, in feeding the worms with the leaves of some other plants? The answer was, that experiments had been made upon that point, without any success; that the idea, however, was nonsense, for the quantity of food was so great, as to render it absurd to think of providing it, not for a certain want, but merely a contingent one; the expense of such a conduct would absorb all the profit. Nor is it frosts only that are dreaded; great and sudden heats make the worms fail, and they labor very poorly. 2. The extreme labor of attending the worms, is a great objection to the business; it is, for the last fifteen days, so severe as to kill many; and, for the last eight days, they are cleaned every day.

Upon a comparison of the culture of the olive and the mulberry, it was remarked to me, that one great advantage of the olive, was the contracted space in which the roots feed, consisting chiefly of a tap-root and fibres, which made the crops sown under them good; but a mulberry threw out a profusion of roots, fifteen or twenty feet around in every direction.

They have been known, at eleven years growth, to yield 200 lb. of leaves each tree.

The mulberry is found not to like water; for there is in the watered meadows a mound of earth, to keep the water from the roots of these trees.

When silk-worms are ready to spin the cocoon, if they are cut in halves and thrown into vinegar, each worm gives two transparent ligaments, very strong, for making fishing lines, &c. &c.

Loriol.—Mons. L'Abbé Berenger, curé of this place, has given an uncommon attention to this culture; he was so obliging as to give me the result of many years' experience on this interesting subject.

Time of sowing.—There are two seasons; the first, with the fruit, fresh, at the end of June—the second in May, with the seed of last year, dry; and this is better, because the June sowing suffers sometimes, if frosts are severe, or the weather is both cold and humid. When sown dry, if too early, and cold weather succeeds, they are apt to fail. They are often watered.

Transplantation.—In April following, those that were sown in May are transplanted, three feet every way, into the nursery; only half the plants (the best) being drawn, the rest are left till the year after. They are never transplanted a second time.

Sort.—The *feueille rose*, with white or grey fruit, is the best; black fruit not known here, but said to be good for leafing late, and escaping frosts in the spring.

Grafting.—It is best to graft, in the nursery, in May, when they are three years old, at the head, with grafts cut in February preceding, and preserved in sand in a cellar: these grafts are branches three feet long, which are buried in sand, except four inches at the end, for three or four knots to shoot; if all are buried in the sand, all the knots will shoot. At grafting cut off those knots that have shot out, and use the rest. The time is after gathering the leaves of the standard to be grafted, when the plants are 5 feet, or 5½ feet high. One year after grafting, transplant, that is, about April. Graft three or four branches.

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[*] Vivarais—more south. About midway between the centre and the Mediterranean.

[†] Dauphiné—in the south-eastern part of France, and in the same latitude with, and adjoining Piedmont in Italy.

Soil.—Good and humid sands, and sandy loams are the best: warm, forward, rich, and friable: rocky and stoney soils do well; but all clays are bad. On the lightest stoney lands, the trees come into bearing much sooner than in the rich vale, but these last vastly longer; on the rich vale-land, two hundred years are a common age for them.

Planting.—In bad land plant at eighteen feet square, in moderate at twenty-four, and in very good at thirty-six; and, after seven or eight years, there can be no crops under them, if at these distances. There are two sorts of trees, the one large standards; and the others dwarf ones, which they call *murier nain;* an arpent contains, of course, many more in number of these than of the others; and they yield, for the first ten or fifteen years, a larger produce, but afterwards the greater trees are more productive. The dwarfs are best for being set in rows, for ploughing between; they are grafted at 1½ feet high; are never watered. The price of trees 25 *sous* the hundred, at the age of one or two years; the great trees, at four or five years, for grafting, 20 *sous* each, at present 15 *sous* each, and grafted. The operation of planting is performed by digging a hole 6 feet square, and 2½ or 3 feet deep; and they commonly lay dung upon the roots.

Cultivation.—The attention with which they manage the trees after planting, merits the highest commendation—after they have been planted two years, a trench is dug around each tree, about two feet deep, which is left open all winter, and filled up again in the spring; the year following, another is dug, more removed from the tree, which is managed in the same manner; and so on, every year a trench, till the whole land is stirred as far as the roots extend. This appears to be a most excellent system, and preferable to trenching the ground at first; as in that way much of it is consolidated again, before the roots of the young trees reach it.

No crops whatever to be sown on the land after the trees are of a size to have their leaves gathered; as much is lost in leaves as is gained by such crops.

The trees should never be pruned at any other season than March, and but once in two years; the wood pays the expense: they receive one digging per annum, at 6 *livres*, and a hoeing at 3 *livres* per arpent.

There is another admirable practice known here, and used by all skilful cultivators, which is, that of washing the stems of the trees every year, in May, for four or five years after planting. Mons. L'Abbé Berenger always practises this with great success.

Produce.—For the benefit of the young trees, they ought not to be stripped for seven or eight years after planting into the field; they will pay well afterwards for this forbearance; but the practice is not common. I viewed a young plantation of Mons. Blanchard, at present in the national assembly, who is famous for his attention to his mulberries; the trees were six, seven, and eight years old, and none of them had ever been stripped, and their appearance was very flourishing. Mons. L'Abbé Berenger approves the practice, but has not adhered to it; his trees, however, are very fine, and do not complain; one plantation, of eight or ten years growth, that have constantly been stripped, are, notwithstanding, very fine. There are forty on 400 *toises* of land, that this year produced, each tree, 8 lb. of leaves. The beginning of February he planted the land under them with potatoes, which were dug in August, and produced forty quintals; among these potatoes maize was planted in April, in squares of five or six feet, and the produce of that will be five or six quintals, at 8 *livres* the quintal. He shewed me another plantation, of an arpent, of very fine and flourishing dwarf trees, which yielded this year 8 lb. of leaves each tree, and 300 lb. on the arpent. They are ten years old; no crops have ever been sown under them.

The produce of leaves may be estimated at 50 lb. from a tree of a *toise* square. The greatest produce known is 10 quintals, from a tree of fifty years old. At twenty years the medium is two quintals. They increase till sixty years old, but are in good perfection at twenty.

The Eggs.—A paper of nine inches by fifteen inches, covered with small leaves, stuck full of worms, gives one quintal of cocoons; and this is what they call one ounce of *grains.* But proportions will not hold, for the produce is not increased proportionably to an increase of quantity.

Hatching.—Retarding the hatching of the worms with particular views, is, in many circumstances, impossible. When once the heat of the atmosphere is come to a certain pitch, the hatching cannot be retarded by cellars. Mons. Faujas remarked, that in June, they would hatch in an ice-house; which shews that at a certain age they will hatch in spite of cold. They never, however, trust to the natural heat for hatching them, which always does it too slowly; it is done with the assistance of fire, and in the month of May. They begin to hatch at 20 to 22 degrees (Reaumur); but artificially it is done at 24 degrees. When the eggs happen to have been put in a cellar, at 10 degrees, their common temperature, they afterwards hatch with difficulty, and never well; always best when they have to undergo but a moderate change.

Feeding.—In this business all sorts of food, except the mulberry-leaf, is rejected, at the first mention, as the most ridiculous, impracticable, and impossible idea, that ever entered the head of a visionary; and never could be conceived but by those only who amuse themselves with a few worms, without taking the trouble of calculating quantity, expense, and quality of silk.

For one ounce of grain, a room of 10 feet by 14 feet, and 12 feet high, is necessary; but the larger the better, and with windows only to the north. There should be ten tables, or shelves, 6 feet long, and 4½ feet broad, one 18 inches above another; the first expense of which 60 *livres.*

Till the 18th of April, there is here no security against frosts. Two years ago there were many leaves before that day, and most people began their operations; the leaves were all cut off, and they lost the year entirely, for it is three weeks before the leaves come again. Mons. L'Abbé Berenger would not trust appearances; did not begin till after that day, and had as good a year as at any other time.

The expences are usually borne between the parties, and amount to half the produce, not including the keeping the utensils in repair. But if they are paid by the owner of the mulberries, some of them amount to as follow:—gathering the leaves, 12 to 15 *sous* the quintal; for gathering the dwarfs, only half the price of the others; wood, 15 *livres* for 1, 2, or 3 oz. of eggs in one room; 30 *livres* for 6 oz. because in two rooms; 22 *livres* 10 *sous* for labor in the house; spinning, 40 *sous* per lb. of silk. The waste is worth 20 *sous*, therefore the expense is 20 *sous*.

For the last four or five days, eight men are necessary to gather leaves for 20 oz. of gain, their voracity being incredible the latter part of the time.

The price of the leaves, if bought, is 4 to 5 *livres* the quintal, never at 3 *livres*, but has been at 10 *livres*. From 15 to 18 quintals of leaves give one quintal of cocoons, and one of cocoons gives 9 lb. of silk. Cocoons are sold at 26 *sous* the pound; silk, on an average, at 19 *livres*. The leaves, dissected by the worms, are dried, and kept for hogs, sheep, &c., being worth four *livres* the quintal; and an ounce of grain yields two quintals of such: and the dung of the worms, from an ounce, is worth 4 *livres* more, being excellent; the best indeed of all others.

Two brothers here, Messrs. Cartiers, have had as far as 80 quintals of cocoons. Mons. Berenger's three hundred trees on an arpent, at 8 lb. of leaves each, are 24 quintals; and, at 4 *livres* the quintal, amount to 96 *livres*; and as 16 quintals of leaves gives 9 lb. of silk, at 19 *livres*, it is 171 *livres*; and for 24 quintals 256 *livres*, the half of which is 128 *livres*; hence, therefore, to sell the leaves at 4 *livres* the quintal, does not answer equally with half the produce, (128 *livres* per arpent *de Paris*, is £6. 4s. 3*d*. per English acre.)

PROVENCE.[*]—*Avignon.*—At 10 years growth the mulberries yield a considerable produce; at that age they give 100 lb. to 150 lb. of leaves, but not common. For one ounce of grain, five or six very large trees are necessary; or, if the leaves are bought, to the amount of 24 to 30 *livres*. The ounce will give from 40 lb. to 50 lb. of cocoons, or 5 lb. of silk, but more commonly 12 lb. of cocoons for 1 lb. of silk. Gathering the leaves 10 or 12 *sous* the quintal, one with another, dwarfs and standards. The waste pays the spinning.

Aix.—Mulberries, beyond all comparison, more profitable than olives; will give 3 or 4 *livres* per tree, more regularly than olives will 10 *sous*; but the great plantations of olives are on barren rocks that will not do for mulberries.

Tour d'Aigues.—One ounce of grain requires 15 quintals of leaves, and gives 50 lb. of cocoons; that is, 50 lb. in a small undertaking, like the house of a poor family; but not more than 30 lb. in a large building. Mons. the President has, however, had 75 oz. of grain that gave 40 lb. one with another: 14 lb. of cocoons give 1 lb. of organzine silk.

On good land, twenty trees, of ten years old, will give 15 quintals of leaves. The waste, with the addition of 10 *sous* per lb. will pay the spinning. Wood is 12 *sous* the quintal, and 1½ quintal will wind and spin 1 lb. of silk: and one quintal of charcoal will make 3 lb. of silk. The common calculation is 10 quintals of charcoal for 1 oz. of grain.

Labor and fuel, 40 *sous* per lb. of silk, exclusive of gathering the leaves; but the common method is to find the trees and the grain, and give half the produce for all the rest. The whole business, exclusive of winding and spinning, employs exactly a month.

Hyeres.—This article is here but little regarded; the number is not considerable, nor do they pay nearly the same attention to them as in Dauphiné. A tree of twenty years pays about 30 *sous*; and some, of a very great size and age, 6 *livres*.

Frejus.—Close without the town, on the banks of a small canal of irrigation, are five or six of the largest mulberries I have seen, growing close to the water's edge; from which it should appear, that they have here none of that objection to water which was mentioned to me at Montélimart.

Estrelles.—At the inn here there is a mulberry-tree which yields black fruit, and leaves of a remarkable size. I asked the master, if he used them for silk-worms? *Never*, he replied, *they are no better for them than elm, oak, or pine leaves: it is the white mulberries that are for worms.* So inaccurately understood is this point, even in the silk countries; for in Languedoc they told me, all sorts were given indiscriminately. This tree would be worth 2 or 3 *louis* a year.

To these notes, taken by myself, I shall add a few others, for the more general elucidation of the subject.

Languedoc yields, in a common year, from 500 to 1,200 quintals of silk.[*] I have searched books in vain for information of the quantity of silk produced in all France; but I find the number of looms which work it, by one account, 29,000,[†] of which 18,000 at Lyons; but by a later and more authentic account, there were at Lyons only 9,335 looms, which worked about 2,000,000 lb.[‡] and in all France 17,500 looms; which, in the same proportion, would work about 3,763,000 lb. In 1784, she imported raw silk to the value of 29,500,000 *livres*, and in 1787, to 28,220,000 *livres*; call it 29 millions, and 20 *livres* the mean price per lb. it is 1,450,000 lb.[||]; which will leave about 2,310,000 lb. for the home produce, or 46,200,000 *livres*, which is so gross an impossibility, as to ascertain to a certainty, the exaggeration of the number of looms, and confirms, in a fresh instance, the many errors in the new Encyclopædia. If Languedoc produces only 100,000 lb. all the rest of the kingdom cannot produce twenty times as much; for the culture is confined to three or four provinces, except small quantities, that enter for little in a general account. I was informed, at Lyons, that the home growth was about a million of pounds weight, of two-thirds of the value of the imported per lb. or about 20 *livres*. This makes the growth to the value of 20,000,000 *livres* or £875,000. If so, Languedoc must produce more than 100,000 lb. for that province must be at least one-fourth, if not one-third of the whole. I must confess I have my doubts upon this point, and think that even one million of pounds much exaggerated, for I crossed the silk country in more than one direction, and the quantity of trees appeared inconsiderable for any such produce. But admitting the authority, and stating that the kingdom does produce to the amount of 8 or £900,000 sterling, I must remark, that the quantity is strangely inconsiderable, and seems to mark, that the climate has something in it vastly inferior to that of Italy, for the production of this commodity; in which country there are little principalities that give more than the whole kingdom of France. Yet, to human feelings, there is no comparison between the climate of France and that of Italy; the former is better, beyond all question. But the spring frosts (found in Italy also,) are what bring the greatest destruction on this culture, and will forever retard its progress greatly in countries exposed to them. In 1788, there was a general failure in the south of France, yet across the Pyrenees, in Catalonia, the crop was abundant, merely because the spring frosts did not pass those mountains.

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[*] Provence—the south-eastern extremity of the kingdom, and bordered by the Mediterranean.

[*] *Considerations sur le Commerce de Bretagne*, par Mons. Pinczon du Sel des Mons. 12 mo. p. 5.

[†] *Lettre sur les Muriers and Vers a soie, Journal Oeconomique.* 1756, vol. ii, p. 36.

[‡] *Encyclop. Methodique Manuf.* tom. ii, pt. 2, p. 44.

[||] A very late writer was strangely mistaken, in saying, that France imports 20,000,000 of pounds weight. *Mr. Townshend's Journey through Spain* vol. i, p. 52.

In the districts and spots of the southern provinces, where the climate has, from experience, been found favorable to silk, there is no want of exertion in following it; and about Loriol and Montélimart, it is cultivated with more energy than in any part of Lombardy; yet at small distances there are no mulberries, though the proprietors are as rich and as industrious as where they are found. The same observation is to be made every where, and seems to mark a great dependence even on the locality of climate, if I may hazard such an expression. Where the culture succeeds well, it appears, from the preceding minutes, to be highly profitable, and to form one of the most beneficial objects that can attract the attention of the industrious.

ESSAY ON THE PRODUCTION OF SILK, AND THE PECULIAR ADVANTAGES OF VIRGINIA FOR THE CULTURE.

(By the Editor.)

I. *Sketch of the natural history of the silk-worm.*

The silk-worm, like all other insects which are winged in their most perfect state, passes through three different conditions of existence, three entirely different kinds not only of outward form, but of instincts and of habits; and in each one of these forms and conditions, the animal is as different from either of the others, as a beast is different from a bird, or either from a fish. These transformations of insects are of such common occurrence, and so general, as scarcely to be noticed by most persons; and yet they are so wonderful, that if they were rare, or the knowledge of them depended upon the testimony of others, the facts would not receive belief. Small and humble as these may be considered among the works of the great creator of all things, there are none which more strikingly display the wisdom of design, and the wonders and beauty of his workmanship. With variations of time, form, and circumstance, as numerous as are the different kinds of winged insects, all of them agree in being subjected to these three successive changes: First, from the egg is hatched a a worm or maggot, which merely devours voraciously its proper food, for its appointed time. Secondly, it becomes a chrysalis, of contracted size, and of form and appearance altogether unlike, cased in a close envelope, in which it remains dormant, motionless, and apparently lifeless, and without food or respiration, for days, or months, or even for years, according to its kind. Next, it bursts this envelope, and comes forth a winged animal, which refuses its former chosen food, and is incapable of existing in the habits or condition of either of its previous forms. Many of these last forms are among the most beautiful and splendid of the animal kingdom; and nothing but the imperfection of human vision prevents remarkable beauties being seen to decorate the most common, and the least noticed, of flying insects. With most classes, the functions of their winged state are so much the most important, that we scarcely notice their previous states of existence; while in others, and the moth from the silk-worm is one, life in the winged state lasts but a few days, and its only purpose is the reproduction of the kind.

The eggs of the silk-worm will hatch in the natural temperature which usually follows soon after the putting forth of the leaves of the mulberry trees, which serve for its peculiar food. Unless checked by too cold a temperature, or by other unfavorable circumstances, and when supplied plentifully with their proper food, the worms increase rapidly in size. But as the skin does not grow with the general developement of the animal, the body, in a few days becomes too large for its covering. The worm then becomes sluggish, and its appetite is suspended; by a curious provision of nature, (common to many of the lower orders of animals,) the distended skin bursts open, and the before compressed worm comes forth, again to expand in growth, until the same process of release again becomes necessary. In this manner, four successive moultings, as they are called, are performed; that is, four distinct skins are cast off, in succession, as the worm out-grows them. The times of these moultings are surprisingly regular, under regular treatment, and like circumstances. And even with the greatest irregularity of treatment, not injurious to the health of the worms, these several moultings are are finished in from 25 to 35 days. The worm has then increased to forty times its first length, and to nine thousand times its first bulk and weight. It then ceases to eat; and, for the purpose of forming a protecting cover for is approaching dormant state of existence, it begins to spin, from the reservoirs in its own bowels, the beautiful and delicate yet strong silken thread, which is so highly prized by man, and for the sake of which, this feeble animal receives so much of his care. After having thrown out from its mouth enough scattered threads to fix its designed structure firmly to some support, in the chosen position, the worm begins and continues to spin, and to encircle itself with, one unbroken filament, carried around its body, and placed in successive layers, as regularly as spools are filled by the most perfect machinery, until the supply of material is exhausted, and the little oval dormitory is complete and secure. The work is then finished. In its close cell, the last skin and the outward form of the worm are both cast off; and the juices exuding from the body soon harden into a dark colored thin and close shell. This is the chrysalis state. The body is shortened, and contracted in size; and the form is as much changed, as the appearance in color and size. After a short time, the thin shell or skin of the chrysalis is also thrown off, and the insect opens a way through its silken dwelling, and comes forth a winged moth.

To many vulgar eyes and understandings, these several changes of the outward form of insects, are absolute transformations, or metamorphoses, as complete as any told of in fairy tales, and as unaccountable as if a magician, merely by words of incantation, or waving his wand, were to change a man to a beast, or a reptile. And to such persons, who do not know that such complete transformations are altogether impossible, these would appear less strange and incredible than will the true facts of the case. It has been ascertained, by delicate dissections and careful observation, that each one of the successive and various outer forms of the insect is but the cover and disguise of the next which is to appear. The several skins which the worm throws off and renews, without changing its figure, are probably produced by the mere solidifying of the juices exuding from the newly stripped body. But the very different and successive forms of maggot, chrysalis, and moth or fly, all exist at once, however faintly traced, in the semi-fluid pulp which fills the body of the animal. Thus, the form of the silk-worm-moth may not only be easily traced within the chrysalis, but also, though more faintly, in the latter stage of the previous form of larva, or worm.

It is a curious matter for consideration, that although the silk-worm is as certain to live and to thrive as any other animal, under the artificial treatment and proper care of man, yet, if without that care, in any known region, and under any natural circumstances which we can suppose to exist, that few could live even a month; and, if left to sustain themselves, and exposed to the inclemency of the weather, and to the attacks of their numerous and resistless enemies, that the whole of the feeble race would probably become extinct within the year. Of course, this absolute necessity for artificial nurture could not have always existed; for there must have been a time when man had not learned the value of silk, or the skill required for its culture. It may be presumed, that in the forty-six centuries, (as asserted by Chinese authors,) during which the silk-worm has been under the care of man, that like other long domesticated animals it has changed some of its original instincts and habits, and thereby has ceased to exercise any power to guard against disasters to which it is no longer exposed. It is alleged, indeed, and has been so stated in books, that silk-worms have been in part, and extensively, raised in their native country, China, on trees in the open air. But the general facts of the extent of this peculiar mode of silk-culture, have not been established by sufficient authority; and even if it were possible so to raise silk-worms, we should have no faith in the greater cheapness or profit of this method. Silk, of some kind, may be made from the cocoons of various kinds of caterpillars; and large wild silk-worms, as they have been called, exist in this country as well as in China; and high hopes were entertained in Virginia, 190 years ago, of the great profits to be derived from raising, in preference, this "natural Virginia silk-worm."[*] There are three kinds of wild silk-worms in China, as described in a memoir on the subject by the French jesuit missionary, D'Incarville; but it is certain that neither of these is like the domesticated insect, inasmuch as the latter feeds exclusively on the leaves of the mulberry tree, and the former are stated to reject this food, and severally, to eat the leaves of the oak, the ash, and the *fagara*, or Chinese pepper tree.

China is supposed to be the native country of the domesticated silk-worm. There are extant Chinese writings on this subject more than 4000 years old; and a compilation of extracts on silk-culture from Chinese books of very great antiquity, (compared to any such treatises produced in what we are fain to consider as the civilized world) has recently been translated into French, and thence into English, and published in this country.[†] From this very curious work it would seem that silk-worms have not changed materially, if at all, since the remote times of these writings, and that they were no more then than now, able to dispense with the tender care of man.

II. *The early progress of the culture and use of silk.*

Until the sixth century of our era, the production of silk was confined to China, and the Seres, a tribe driven by their more warlike foes from China to Bucharia, where they found refuge, and established this branch of their former industry. From the latter country silk stuffs were sent westward until they reached Rome, in small quantities, and burdened with enormous expenses of transportation, and of the intermediate profits of the Persian and other traders. Virgil, the earliest writer of the west who expressly mentions silk, describes it as "the soft wool which is combed from the trees of the Seres," by which, it would seem that its origin had been confounded with that of cotton. Notwithstanding its increasing use, for centuries afterwards the Romans were not much more correctly informed on this subject. The next notice of silk by any Roman author, is by Pliny the elder, who speaks of it as a product of the Greek isle, Ceos, and as being derived from caterpillars which fed on the leaves of the cypress, ash, and oak trees. These, of course, could not have been silk-worms. The price of silk was so great, that even two hundred years after Pliny, the stuffs sold for their weight in gold. It is recorded that as late as the reign of Aurelian, that sovereign of the world refused a robe of silk to his empress, on account of the high price. The costliness and great beauty of such apparel had, at a much earlier date, caused it to be counted among the most expensive and rare ornaments of women; and in the reign of Tiberius, the law required "that no man should dishonor himself by wearing silken garments." Heliogabalus was the first of the emperors who used silk robes; and his doing so was deemed an offence so great, as to be enumerated among the many atrocious and infamous crimes of that monster.

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[*] See the curious old poem, or rather string of doggrel rhymes, on this subject, dated 1652, and re-published in the first volume of the Farmers' Register, p. 784.

[†] See extracts from this volume at pp. 226 and 353, vol. vi, of Farmers' Register.

The use of this luxury continued however to increase among the Romans, until it was not only fully tolerated, but came to be considered a necessary of life to the rich and great; and it became a matter of public and national interest and policy, to be able to purchase silk free from the extortion of the Persians, the immediate suppliers, and who, moreover were often at war with the Roman empire. But all efforts for lessening the evil were vain, until accident produced results which all the power of the Roman government had not been able to approach. Two Nestorian monks, by the persecution of their christian brethren of other sects, had been driven from India, and took refuge in China. There they saw, with wonder, in common use, and at comparatively low prices, garments of a material which they had been accustomed to consider as almost sacred to the use of princes. They also observed the insects which produced the material for these rich stuffs, and learned the manner in which they were reared, and their precious spoils obtained. Rightly conjecturing that this information would be highly valued and well rewarded, they made the long and dangerous journey to Constantinople to impart it, and to sell their plan to the emperor Justinian. He encouraged their returning, to procure the eggs of the silk-worm. They did so; and by concealing the eggs in their hollow canes, they were enabled to elude the jealous scrutiny of the Chinese, and to carry safely their charge to Constantinople. The eggs were there hatched, and the worms reared to propagate their race; and mulberry trees were planted to secure in abundance their proper sustenance.

Justinian made a royal monopoly of this new and rich product. But after his death, the culture spread from the capital over Greece proper, which became devoted to mulberry and silk-culture, and continued for 400 years to enjoy the benefit of being the only European silk-producing country. Religious persecution had been the cause of bringing the industry from China to Greece; and war, which has served indirectly to confer so many great blessings, as well as, directly, to produce so much suffering to the human race, was next the means of extending the knowledge and the art of silk-culture to other regions. When Roger the Norman king of Sicily, invaded Greece, in 1146, and spread devastation and ruin over the Peloponesus, among the other spoils of his conquest, he carried off many captive Greeks, who, by his order, taught his Sicilian subjects to rear silk-worms, and to manufacture their products. The silk stuffs of Sicily soon became celebrated. Thence, in time, the culture was spread over Italy, which still is the only country in Europe where it is very extensively pursued. Still, all the discouragements produced by the rule of Turkish despotism and barbarism, have not prevented silk continuing to be one of the most important products of the country into which the culture was first introduced and established by the policy of Justinian.

The attempts to establish silk-culture in the more western parts of Europe have been far less successful. The cause of difference, is to be found in the difference of climate; the eastern, or more distant from the ocean, having much greater extremes of heat and cold, or hotter summers and colder winters, in the same latitudes. And this *defect* of temperature, as it has been commonly considered, (or wide extremes,) in the following argument, will be maintained to be an important *advantage* for silk-culture; an advantage which Greece possesses over Italy, and Italy over the south of France; and, as it may be inferred, for similar reasons, our own country over the silk producing regions of all Europe. But to return.

III. *The climate of France, and western Europe in general, unfavorable to silk-culture.*

Silk-worms and mulberry trees were first introduced in France in 1450, by Louis XI; and in 30 years silk stuffs appeared among the fabrics of Lyons and Tours. Subsequently, both the culture and the manufacture of silk were zealously encouraged by the government, especially under the reigns of Charles VIII, Henry IV, and Louis XIV. The manufacture has flourished. But in all the longer intervals between the different times of greatest effort to promote its growth, the culture and production of silk languished; and indeed it would seem that it is only since the general peace, in 1815, that France promises to derive any considerable portion of her great agricultural income from the production of silk. This opinion as to the second greatest silk producing country of Europe may probably be considered altogether unfounded and untenable. But it seems to be sustained by the general and direct statements of the latest French work which we have seen, (Morin's '*Manuel.*') After speaking of the previous times of depression which had occurred between the shorter periods of prosperity caused by particular encouragement during the few detached reigns just named, the author adds, that "under Louis XV, and Louis XIV, and still more during the first years of the revolution, silk-culture was struck with discouragement. Under the empire, it was barely not forgotten among the other manufactures. But since the restoration [1815] the establishments in which silk-worms are raised and the culture of silk prosecuted, have taken a consistency and growth much more considerable than had existed for a long time previously."

If a judgment may be formed from the testimony of Arthur Young, in his voluminous and interesting and valuable report of the agricultural practices and products of France,* the opinion above stated is greatly confirmed. His travels and personal observations were made immediately before, and during the early part of the revolution, and just at the close of the longest period of internal tranquillity and of general prosperity that France had ever enjoyed. And yet at that time, the mulberry plantations must have been very few, even in the southern part of the kingdom, to which they were almost confined, and the business of silk-culture far from profitable. This deduction is unavoidable from all the statements in Young's chapter "on the silk-culture of France," which was copied in the preceding pages of this number, (see p. 135 to 140.) In addition to these very full statements, the following will be quoted from his chapter on "climate." After having stated many particular examples of the severe effects of late frosts on other vegetation, and through the country in general, he adds—"perhaps it may arise from the late frosts in the springs, that we meet with so few mulberries in France north of the *olive district*. The profit of that tree is very great; yet the districts where they are found in France are very inconsiderable, compared with the extent of the whole kingdom." In a previous passage, (and in his map,) he had divided France, in regard to climate and vegetation, into three regions, described in his own words, as "1st, the northern, where vines are not planted; 2d, the central, in which maize (or Indian corn,) is not planted; 3rd, the south, in which *olives, mulberries, vines and maize*, are all found." He afterwards marks the northern boundary of this *olive district*, (without the limits of which "so few mulberry trees were met with,") by a line drawn through Montelimart and Carcassonne, which leaves on the Mediterranean, for the whole "olive district," not more than one-twelfth part of the area of France. And a third of even this small district must be much colder than the rest, and therefore unsuitable, as one extremity rises into the Italian Alps, and the other into the Pyrenees. Malte-Brun seems to limit the silk producing region to still less space. This author gives but the following scant notice of the silk-worms of France, when enumerating the insects which are among the valuable and productive animals of that kingdom: "The silk-worm, habituated to the climate since the time that Louis XI. planted the mulberry tree, forms by its products *part of the riches of Dauphiny*. The weight of raw silk thus obtained in French manufactories, is equal to 5,200,000 killogrammes." [*Universal Geography, France, book* 141.] The ancient province of Dauphiny comprehended the territory in the south-east, which is now divided into the three departments of High Alps, Drom, and Isere; and to this small space, the words of Malte-Brun would seem to limit silk-culture, considered as either a principal, important, or very valuable employment of industry in France.

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* Travels in France during 1787, 8, 9, by Arthur Young.

In another part of the same chapter of Young, are the followwing passages. "Mulberries might in France be an object of far greater importance than they are at present, and yet the spring frosts are fatal impediments to their culture."—"Tours is the only place north of the maize climate where they are cultivated for silk with any success." To this testimony of the author of the very small proportion of the kingdom in which mulberry trees were raised, there may be added the facts that raw silk to the value of nearly 30 millions of livres was imported to supply the manufactures of France in 1784, and almost as much the next year.

These views of the comparative unfriendliness of the climate of France, and even that of the portions of that country most favorable to silk-culture, are very different from the opinions which have prevailed among us; and which have had, and still have, an unfavorable effect here, by their carrying with them the admission that the climate of the south of France is better than ours for silk-culture. Those persons, here, who are the least acquainted with the true condition and disadvantages of silk-culture in France, set out with the the discouraging admission, that the culture here must be necessarily less successful, because of the supposed great and superior advantages of the milder climate of France; and that, do what we may, our products and profits cannot compare with those of France. The better informed, who know the defects of French silk-culture, but who have not the less admitted its superior natural advantages, would thence necessarily infer still worse prospects, and profits altogether insufficient, for that industry in this country. Thus, to almost all persons, the supposed condition, whether advantageous or otherwise, of silk-culture in France, the silk country of which we know most, operated as a stumbling-block in the way of all efforts in the United States. This being the case, it is proper that we should more fully discuss this branch of the subject, and endeavor to remove the difficulty, by refuting the position which has so long and so greatly served to discourage effort here.

Among the best informed persons who have taken this mistaken view, we will cite a writer in the 4th volume of the Farmers' Register, whose agricultural opinions are always worth hearing, and who always, even when in error, (which has been rarely the case,) maintains his ground most ably.* His argument is as follows:

"The culture of silk was a favorite object of attention in Virginia, Georgia, and other parts of our country, at a very early period. The project seems to have been lost sight of for very many years, until lately, when it has been revived with increased ardor, to the north as well as the south, and has occupied no inconsiderable space in your columns. In the numerous publications on the subject that I have looked over, I do not remember to have met with one word of discouragement. I should not feel disposed, were it in my power, to discourage it altogether; but all will agree, that the difficulties attending it, if any, should be fairly stated, and that those who engage in it, should be enable to act "*understandingly*."

"Having paid some attention to this matter, I will give you the result of my inquiries, and certainly have no wish that my opinions should pass for more than they may be found to be worth.

"From all that I have been able to learn, the silk-culture has never been carried on extensively and with success in climates where the cold of winter is long or severe, or in countries that are not well peopled. In China, the breeding of silk-worms, and the manufacture of silk, have been carried on for thousands of years, and at this time, employ a considerable part of the crowded population of that immense empire. It has long since been observed, and I believe, is undoubtedly true, that no two distinct countries, in the same parallels of latitude, resemble each other more in climate, than China and the United States. In turning over the pages of Staunton, Barrow, and other travellers in China, I was struck with the circumstance, that in going from north to south. they did not find the cotton plant an object of cultivation, till they came to about latitude 38, and then only on a small scale, till they had gone some distance further south; showing a striking coincidence, in this respect, between that climate and ours. The culture of silk, does not seem to have extended so far to the north, by several degrees of latitude. In

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* This correspondent was John Wickham, esq. The recent death of this powerful reasoner and enlightened agriculturist, permits his being now here named without impropriety.

France, from all I can learn, and I have taken some pains in the inquiry, it is not extended further north than the banks of the Loire, though it has been attempted in Normandy, and other more northern parts of that country. In Italy, it is carried on as well in the extensive valley of the Po, as south of the Appenines; but this fertile region is fenced from wintry blasts by the lofty ramparts of the Alps, for its whole length from east to west, and its climate is much more temperate in winter than ours, and the length of summer greater.

"If a mild temperature were the only requisite to preserve the life of the worm, this object might be attained by artificial means; and, with due attention, the proper warmth of the apartment in which they were hatched, might be maintained through the cold season, at the proper point, though not without much care and cost; but the worm cannot exist without food as well as warmth, and a constant supply of green leaves is absolutely necessary for its sustenance. Although attemps have been made to substitute other vegetables, I believe none have been found to succeed on a large scale, but the mulberry, some varieties of which are said to be much preferable to others. The mulberry being a deciduous tree, can afford no supply of food during the cold season, as indeed is the case with all other trees or plants, that have been recommended as substitutes. It is true, that the insect, while in the egg, or in the chrysalis state, does not consume any; and it may be possible to preserve the eggs unhatched during the winter in a northern climate, and indeed, it must be so to a certain degree, or the culture of silk would fail entirely in Connecticut. But on the other hand, its want of success in a sufficient degree to make it an object in the south of Germany, the climate of which is not much colder than ours—in England, where it is milder, and this with the advantage of direct encouragement from the public authorities, by high premiums, &c. and in the more northern part of France, while it succeeds further south—leads to a strong, I may say a necessary presumption, that silk cannot be produced as a general object of cultivation in the northern states, or even so far north as Virginia. You will readily suppose that these views are not original. If they were, their value would be less. They are the result of information that I have collected from various respectable sources, and among others, from Young's 'Travels in France,' a work of great and acknowledged merit, which is probably in your possession, or within your reach. If not, you may find it reprinted in Pinkerton's Voyages, &c. In chapter 23d, "*Of the culture of silk in France,*" Pinkerton, vol. 4, p. 569 to 580, are notes on the cultivation of silk in different localities, generally in the south of France. The whole might take up too much space in your Register, but if you can find room for the passage on "*Normandy,*" in pages 571, 572, and for the latter part of the chapter beginning at page 577, "*Languedoc,*" &c. both you and your readers will find a detail of it in facts, I doubt not, an accurate one, relating to this question, and a course of clear and forcible argument that will deserve your consideration, and I think, satisfy you, that silk can never become an object of general cultivation. For myself, I am fully persuaded, that it would never answer on a large scale in our climate, even if the wages of labor were not so high as they now are, or are likely to be, for generations to come."

The copy of 'Young's Travels,' in our possession, is the first edition, 2 vols. 8 vo., printed in Dublin, and is certainly entire. Yet there is no such chapter as that above referred to; and it is only very recently that we have been enabled to find, in the 2nd edition, 4to, in the state library, and probably the only copy in Virginia, that there is this chapter on silk-culture therein, and also several others, which are not in the earlier edition. Not supposing that there could be so strange and unaccountable a defect in the only edition then known, we had inferred that our correspondent, well-informed as he was, had mistaken for Young's, some other article in Pinkerton's compilation, by a different author. Nor could we find that compilation, until very recently. The chapter which has at last been found, has been re-published in the foregoing pages, as introductory to this article. It was by a previous publication of opinion from the pen of this same able writer whose views we have just presented, on the climate of the United States, (see pp. 599 to 604, vol. iv, Far. Reg.) that we were first forcibly impressed with the fact of the remarkable similarity between the climate of China and that of the United States; and the difference of both from the climate of the western coast of Europe and the western coast of America, in the same latitudes, or even where the mean temperature was nearly equal. But from the same premises, in which we acknowledge him as our instructer, we arrive at a very different conclusions from this writer, as to silk-culture in this country. For while showing it to be conducted under great disadvantages in France, he infers that of course it must be much worse in this country; and on the other hand, from the difference of climate, we derive hope, and indeed assurance, of success here, from the very facts of these disadvantages of France. The grounds of this conclusion will be next presented.

IV. *The points of resemblance in climate between China and the United States, and of the difference of both from that of western Europe. The circumstances which make a climate favorable or adverse to silk-culture.*

It is true that the mean temperature of Europe is considerably higher than in the same latitudes in the United States; and in the different latitudes where the mean temperature is nearly the same on these opposite sides of the Atlantic, that the European temperatare is more equable and mild and the extremes of heat and cold much nearer than in the United States. Hence, the warmer parts of Europe, as Italy and the south of France, are more delightful to the feelings, and less hazardous to health, (under like circumstances in other respects,) than any region of this country, where the extremes of heat and cold are so much greater. This region of the most delightful climate of Europe, has also been that in which the silk-culture of Christendom is exclusively carried on with the greatest improvements of art, and with the most profitable returns; and the opinion has thence been derived, which has passed without denial or even doubt, that the warm and mild regions of Europe had the best climate for silk-culture; and that the best climate for that purpose in the United States, must be far less favorable, because more variable, and more cold. It is this opinion which I confidently oppose as erroneous;

and which, if not corrected, must continue to operate as the most powerful discouragement to effort here. But, if it be true, and admitted, that we actually have a better silk-climate than any part of Europe, then new and also the strongest inducements will be held out to our countrymen to compete with Europe in a contest in which nature is our ally.

Great as are the transitions, and remote as are the extremes of temperature, felt every year in Virginia, and however unfavorable they may be to our comfort, or even to health, they are not of the kind to affect silk-culture injuriously to half the extent that is done by the smaller variations of the milder climate of Europe. This seeming contradiction will be explained. When winter has once set in, and vegetation is thereby made dormant, no degree of cold known in Virginia is sufficient to damage the most tender of the mulberry tribe. And, indeed, the severity of the colder spells serves as a safe-guard against the trees (stimulated as they would be by continued warm winter weather,) putting forth leaves with the first impulse of spring, and thereby incurring great risk of the too forward leaves being nipped by late spring frosts. This danger, as has been shown on the authority of Young, and as may be gathered from every French work on silk-culture, is very great in the milder and more temperate climate of France; and it may be inferred, from the operation of like causes, that the same danger, though in a less degree, must also belong to the silk region of Italy. The vicinity of the greater part of all the silk region of these countries to either the Alps, the Pyrenees, or the Appenines, and the consequent frequent exposure to piercing cold winds coming from these snow-capped mountains, must much increase the danger of late spring, or summer frosts. On this account, after the leaves of the mulberry trees have started, and still more after the silk-worm eggs have been hatched, a sudden depression of temperature, though but of 20 degrees, yet if serving to cause frost, might be destructive to the crop; when a variation of 40 degrees in this country would, in comparison, be harmless. The important difference in the two different climates is this. Moderate as may be the variations in Europe, the range of the thermometer will often be found from enough *above* the freezing point to urge vegetation to put forth, to as much *below* it as will serve to kill the vegetation so produced. Here, with far greater variations and extremes of temperature, our mildest winter weather is too cold, or the warm spells of too short duration, to permit the mulberry leaves to spring prematurely; and in latter, spring and summer, there is no weather cold enough to hurt them. The winter transitions here are between moderately and excessively cold weather; those of summer, from moderately to excessively warm. But the mean temperature of the cold season is low enough to keep vegetative life suspended, and therefore safe; and the temperature of the warm season is always high enough for the safety of the mulberry leaves after they have opened and begun to grow. It will be readily perceived that the very great and sudden and unpleasant fluctuations of temperature, which constitute the great and acknowledged defect of the climate of Virginia, are not incompatible with enough of steady cold weather in winter, and steady warm weather in summer, to make a far better silk-climate than that of a country the most blessed in mild and regular temperature. There is not sufficient distinction usually drawn between a climate being considered warm for its winter or its summer temperature. The south of France bears in safety the pomegranate, the olive, and the orange, none of which can grow in open culture, in Virginia; and hence it would be supposed that the former region is much the warmer. But it is the mildness of the winters, which prevents their being killed by intense cold, and not the greater or more regular heat of the summers, that sustains the life of those trees. And it is not warm winters, but the reverse, if connected with warm summers, which are required for the greatest success of mulberry and silk-culture.

A strong support to the position just stated is presented in an account of the causes of failure of the silk crop in the department of Gard, which reaches to the Mediteranean, and is in the south-eastern part of Languedoc, and in the warmest and best silk region of France. This article is in a French periodical, and though long in our possession, had not been read, or supposed applicable and useful here, until this essay had been written. A translation of the article will succeed this; and the reader will there find fully displayed the disadvantages of warm weather in winter, as well as of cold weather in spring and summer afterwards. Admit to the full extent the intelligent author's proposition, that the unusual warmth to which the eggs were exposed in winter injured the vitality and health of the worms, and that the late frosts cut off the supply of food from the too early hatched worms—and still there remains a manifest remote or *earlier cause* of these immediate causes of failure, viz: the warm weather of winter having stimulated and forwarded the vegetation of the mulberry trees, so as to expose the leaves to be killed by the late spring frosts afterwards. A much colder winter would have greatly protected the trees, by keeping vegetation inactive, even if it had not entirely prevented the evils of the temperature of the succeeding spring. And both a cold winter and a hot spring and summer, (or the usual degrees and variations of temperature in Virginia,) would have been a certain safe-guard against all the losses which occurred in this, the warmest part of France.

The vigorous growth of the most valuable of all grains, Indian corn, may serve as an indication of the summer climate most favorable to silk-worms. This plant requires much heat of summer, and of sufficient duration to perfect its growth, and is not affected by the intense cold which may reign in winter. And it will neither flourish nor ripen in a climate of much more elevated mean temperature, but of which the heat of summer and the cold of winter are less remote. Thus, while this grain grows in the highest vigor and luxuriance, not only in the longer summers of Virginia, but under the very rigorous climate of New England, and even in Canada, where the winter lasts nearly half the year, yet in Europe it is no where so productive, not even in the olive region; and cannot be raised to profit where the mean temperature is much warmer than that of Virginia. Our cold winters are merely not hurtful to the culture and product of Indian corn; but for mulberry and silk-culture they are decidedly and greatly advantageous. By artificial cold, we may guard the eggs of silk-worms from hatching too soon for the full supply of food; but it is only a natural climate of sufficient rigor in winter that will keep back the springing of the mulberry leaves, long enough to avoid such spring frosts as are common in the south of France, and even in Lombardy. From these different causes, it follows that the destruction of mulberry leaves by late frosts, which is a calamity so frequent in those delightful and warm climates, will be of very rare occurrence in Virginia. And, to extend the ground of remark, it may be safely inferred from the several positions assumed, (if they are considered as maintained,) that in no part of the United States is the rigor of winter any obstacle to silk-culture, unless the mulberry trees (while vegetation is dormant) are killed or injured by the cold; nor the long duration of winter weather, except so far as shortening the time for growth, and lessening the summer's product, of the mulberry leaves. Neither is it supposed that in the most southern states any important obstacles of opposite character will operate; for though the mild winters there will hasten vegetation, steady warm weather succeeds as early in proportion; and the summer is there long enough to raise several successive crops of worms, and yet pretermit the time of excessive heat which would be injurious to their health.

There is another view of this part of the subject which deserves more consideration than the incidental notice taken of it above. The remarkable differences of temperature in the same latitudes, which are found to exist on the opposite coasts of the Atlantic, are also found on the opposite sides of the Pacific ocean. Thus the eastern coasts, both of North America and of Asia, are much colder, in mean temperature, than the western coasts of both continents in the same latitudes. This is not the place to discuss the causes; but the effects are known to be as just stated.* Hence, it might be inferred, in the absence of facts for evidence, that the climate of the United States, both in mean temperature and in extremes, is much more like that of the same latitudes of China, which is similarly situated on the western side of an ocean, than either is to the climate of any part of Europe; and this position is also sustained by unquestionable facts. This conclusion then, to which we came both by way of reasoning and experience, furnishes additional strength to my position, that the climate of Virginia is better for silk-culture than the best in Europe. For in China, though with less advantage of the improvements of art or science, the business is undoubtedly conducted with more success than in any part of Europe; and therefore, as well as for the other reasons stated, it will scarcely be doubted that the climate of China is among the best for this purpose.

The cold of winter is no injury to the growth and product of mulberry trees, unless it is so severe as to kill their branches; and that is not to be feared in Virginia, even for the most tender kind, nor indeed much farther north. On the contrary, a considerable degree of cold in winter is beneficial, by preserving the dormant condition of the trees, and preventing the too early putting forth of the leaves, and their consequent exposure to the spring frosts, which are so often fatal in the south of France, and even in Lombardy, after winters so mild as not to endanger the growth of the olive and the orange tree.

Neither does the severest cold of our winters affect injuriously, in any way, the eggs of the silk-worms, or the labors and products of the worms. Experience has satisfactorily proved that exposure to cold much below the freezing point, does not affect the vitality of the eggs; and if necessary, it is easy to guard them from severe cold weather. But there is a decided advantage in their being kept at a low temperature through winter, whether natural or artificial, as it retards their hatching in spring until there is no danger of frost, or of deficiency of mulberry leaves, their only suitable food.

Thus our cold winters are either beneficial or harmless to both mulberry trees and to silk-worms; and it is unnecessary to bring proofs that our warm summers are better for both, than the cooler temperature of the summer of Europe.

Another well known difference of climate between this country and western Europe, is the greater dryness of the air here; and a moist atmosphere is even more injurious to silk-worms than exposure to too great a degree of cold. This ground of superiority cannot be disputed; but we are not competent to estimate the amount of its value.* The moisture of the air of England and Ireland, more than the low temperature, has made to fail the efforts there at silk-culture.

It is the proximity of the Atlantic ocean, and the prevalence of winds charged with its vapors, that cause the greater moisture of the atmosphere of the western countries of Europe. And it is the more equable temperature of the ocean, communicated to the winds sweeping over its surface, which serves to moderate and prevent extremes both of heat and cold in those countries. For this reason, as we advance eastward in Europe, from the Atlantic towards Asia, though keeping on the same degree of latitude, it will be found that the places successively reached are more and more adapted to silk-culture, just in proportion as the extremes of temperature become greater.

Arthur Young's practical observations on the climate of France and Italy, and the regions of different vegetable cultures, as marked in his map of the former country, serve admirably to sustain these views; although he does not seem to have reasoned thus from his own observations and facts. His division of France into the three agricultural regions described above, was not made according to any theory, or philosophical speculation, but by his observing and noting, with the practised eye of a farmer, in travelling across the kingdom repeatedly, and in various routes, the places where each kind of culture began, flourished, diminished, and finally ceased. Thus, the region over which mulberries were *generally* cultivated, (not regarding exceptions to the general rule,) showed to him where silk was deemed profitable; where wine was a common product, showed the region in which the vine flourished; and where neither of these were common, he inferred that the climate forbade them both. According to such observations, he has drawn straight lines across the map of France, separating what he calls the southern, central, and northern regions. But instead of these lines running, as perhaps would be supposed by most persons, nearly from west to east, their average direction is about north-eastward. Thus, the line drawn to show the northern boundary of the olive and mulberry region, though but short, has its eastern extremity more than 2½ degrees of latitude more to the north than its western extremity.

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* See this subject treated in an 'Essay on the Climate of the United States,' which was reviewed at page 599, vol. iv, Farmers' Register. This essay, which was first published thirty years ago, was written by the late John Wickham, esq.

* G. B. Smith, esq., than whom there is no better authority on this subject, in his remarks in the Baltimore silk convention, (published since this piece was written,) attaches so much importance to the greater dryness of the air of this country, that he deems that alone sufficient to give to silk-culture here superior profits over that of Europe. See p. 88, vol. vii, F. R.

For these reasons also, principally, if not entirely, the climate of Piedmont and Lombardy is very far better than that of the ancient provinces of Dauphiny and Provence, in France, lying immediately westward, and within the same parallels of latitude; and proceeding still farther westward, towards the ocean, Gascony, though more to the south than Piedmont, is found without the northern boundary of silk-culture, and unfit for that industry, as was then supposed by its cultivators.

Since Young wrote, great and valuable improvements in silk-culture have been made, by Dandolo and Bonafousin Italy, Camille-Beauvais, Carrier, and others in France, by which, and especially by substituting artificial for natural temperature, the business has been successfully extended into regions formerly deemed much too cold and adverse. But though we highly appreciate these discoveries and labors, and have great confidence in the superior profit of the artificial system, still it is not this improved condition of silk-culture that shows the *natural* fitness of climate. It is therefore that the limits of the silk region, and the profits of the culture, as considered fifty years ago, furnish a far more correct indication of climate, than the greatly improved and still improving labors of the present time.

If it is indeed true that the climate of the United States is superior to that of southern Europe for silk-culture, then there need be no difficulty in admitting the fact, which so many different persons have asserted, that *the silk produced in this country is decidedly superior in quality to that imported from Europe.* Arthur Young reports that the French silk then manufactured at Lyons, was lower in price by one-third, on account of its inferior quality, to the raw silk imported, (mostly from Italy it may be presumed,)[*] and if such a vast difference be caused there by climate, we may well attribute to that cause the admitted superiority of the small quantity of silk produced in the United States; and believe that the effect, like the cause, will be *permanent.*

V. *Early attempts at silk-culture in Virginia, and causes of their failure.*

We will now go back to the earliest attempts to introduce silk-culture into Virginia, and show the causes which induced the efforts, and those which brought total disappointment and failure.

It was to the favorable opinion of silk-culture held by James I. of England, and his urgent recommendation, that was owing the earliest legislation in Virginia for its encouragement, and the commencement of that policy which was adopted so early by the colonial legislature, and adhered to so long with no good effect.[*]

The earliest legislation by the house of burgesses, or representatives chosen by the people of Virginia, was in 1621, fifteen years only after the first landing at Jamestown; and two of the acts of this first assembly were designed to maintain the policy of encouraging silk-culture, which still earlier had been urged on the colony by the advice and instructions of the king. One of these acts required that the native mulberry trees should be preserved, when cutting down the other forest growth for cultivation; and the object of the other was to induce and compel the planting of others, for feeding silk-worms. These, with the many subsequent enactments for this purpose, or on this subject, have been recently republished, or the purport stated, in the last volume of the Farmer's Register, to which the curious reader is referred, for the details.[†] It is enough to say here, that for half a century it continued to be the policy of the colonial assembly, and the frequent subject of legislation, to compel the planting of mulberry trees, and to encourage the growth of silk.

But all these many and long continued efforts were fruitless. Silk never became a notable product of the colony, nor have we any account of its having been exported in the smallest quantity, save the tradition that Charles II. had worn a robe of Virginian silk. The planting of the white mulberry tree however, had been very generally extended. One individual had 70,000 trees growing, for which he claimed and received the bounty previously offered by the colonial government. But still no silk appears to have been made, at least not in quantity sufficient to be noted as a commodity of trade; and the only evidence of the encouragement so long offered for this branch of industry, which now remains visible, is presented by the numerous white mulberry trees, the progeny of the parent stock formerly brought from Europe, and which are thickly set, and growing like native plants, on all the uncultivated spots (and especially where the soil is calcareous,) of the banks of James and York rivers.

This total failure of efforts so long and steadily persevered in by government, may seem at first view as showing conclusively that Virginia is altogether unfit for profitable silk-culture, and that the many efforts just now commencing by private individuals, will have no better results. This conclusion would be incorrectly deduced; and it is important to the well and vigorously conducting of this new branch of industry, and to the interests of Virginia, therein involved, that correct views should be entertained as to the great difference of circumstances, formerly and now, by which, measures which are urgently invited at this time, by inducements stronger than any former legislative control or bounty, (however beneficial such aid might be) were then forbidden, or rendered inoperative, by obstacles still stronger.

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[*] See last article of this No., page 189.

[*] The great partiality of James for silken apparel, and its great scarcity and high price, are exemplified in an amusing anecdote of this monarch. While he was king of Scotland only, and being about to admit to a first audience the English ambassador, he wrote a letter (which is still preserved) to his subject the Earl of Mar, to request the loan of a pair of silk stockings for the occasion; "for" he adds, to enforce his request, "you would not, sure, that your king should appear like a scrub before strangers."

[†] See notices on extracts of the oldest laws of Virginia in regard to silk-culture, at pp. 621, 712, 714, 716, 717, of vol. vi, Farmers' Register.

Since the modern improvements in managing silk-worms by artificial and regulated temperature and ventilation have been made known, it may be pronounced that every climate is sufficiently friendly to the growth and health of silk-worms, provided their peculiar food can be produced plentifully and cheaply enough. The question is no longer, whether the natural temperature of the climate is mild and warm enough for the health of the silk-worm; but whether the soil and climate are highly favorable to the growth and regular supply of leaves of the mulberry tree, and that land for the growth, and labor to gather the leaves and to tend the silk-worms, can be also afforded cheaply. Even as to the natural climate and weather, without resorting to the easily available artificial safeguards against inclement spells, there are few regions better suited to the wants of the silk-worm, than all of the lower and central parts of Virginia; and better suited is our climate than that of any of the more northern states, and very far more so than in Connecticut, where silk has been successfully raised and manufactured, in families, for more than 60 years, without the benefit of artificial temperature, or any other of the new and great improvements in the culture and management. All fears of the climate being unfavorable, then, may be dismissed from our minds. Of course, it was not any defect of climate that prevented the success of the government formerly in the attempts to establish silk-culture.

But there were much greater obstacles; and such as would have been insuperable, even if legislation for encouragement or compulsion, had been directed as wisely, as in fact it was unwisely.

It may be seen in many of the old laws that it was not more the care of the government to encourage the raising of silk, than of Indian corn, and other staple products, necessary for the food of the cultivators themselves. But for the stronger compulsion of the danger of starvation, the legislative encouragements to plant corn, and rear live-stock, would perhaps, have been of as little effect as the encouragment of silk-culture. During all those early times, and long afterwards, considerations of profit, or the prejudices formed by old habits, induced the colonists to cultivate tobacco for sale in preference to every other product of agriculture. This alone would have been more than sufficient to counteract all the ill-timed and ill-directed measures of government to induce the undertaking the new and untried production of silk. But besides this sufficient reason, the circumstances of the country in other respects were then as unpropitious to the successful prosecution of silk-culture, as they are now the reverse. These circumstances will be now briefly enumerated.

Besides mild and warm summers, (if artificial heat is not regularly employed,) and besides the abundant and regular supply of mulberry leaves, there are also several other conditions necessary for the successful production of silk, as a crop for market, and still more for exportation. These are, cheap land and cheap labor, and either a sure market at hand for the cocoons, or raw silk, or manufacturing establishments connected with the cultivation, to weave the material for exportation to remote markets. The slightest consideration will show at once that all of these necessary elements of successful culture were deficient during the whole time when it was so strongly urged by the laws alone. Labor was scarce, and greatly wanting for the demands of what were considered pursuits far more profitable than silk-raising. Land, it is true, cost almost nothing in money-prices; but to clear off its heavy forest growth, with very costly labor, made the real price of land very high; just, as now, an emigrant to the west may buy rich forest land for $2 the acre, and yet pay for it, in the cost of clearing and bringing into tillage, more than the price of the best and richest farms on James River. For the raw products of silk-culture there was no near or sure demand; and the condition of a young colony was altogether adverse to the establishments of filatures, and manufactories of silk fabrics. Therefore, it is not at all strange that the comparatively feeble aids and inducements offered by government were without effect.

VI. *The peculiar circumstances which now invite silk-culture in Virginia.*

Now let us consider the present condition of Virginia as calculated either to invite, or to discourage, new exertions to introduce the culture of silk, in addition to the climate, of which enough has been already said.

In the first place, is the production known by sufficient experience to be profitable any where in the United States? This question is satisfactorily answered in the affirmative, by the long continued labors of the many silk-culturists in the far worse climate of Connecticut, on lands far more dear than ours, and labor more valuable for other uses, than we have to furnish. Where a community of industrious and intelligent people have persevered for more than half a century in a certain direction of labor, without intermission, or doubt of the value of their returns, there can remain no question that their profits are not ideal.

If, then, silk-culture, can be successfully prosecuted under the inhospitable sky of New England, surely it can be done in Virginia much better, with facilities merely equal in other respects. But, in addition to the manifest superiority in climate, we possess in Virginia other great inducements to undertake the business, in the present depressed price of our lands, and the low cost of the labor of young or infirm slaves, who must be maintained at the same expense whether so employed, or idle and totally unproductive, as some such are on almost every farm in Virginia, and who yet could well discharge the light and easy labors of feeding and managing silk-worms. From this one source of labor, already fully paid for and supported, and now altogether profitless even when not totally idle, enough operatives might be drawn, in Virginia alone, to produce annually millions of dollars worth of silk. And there is another source from which nearly as much might be obtained—the many destitute but respectable white females, who either suffer from want, notwithstanding their daily and unceasing toil, or live, as wretchedly, dependent on the cold charity of their friends. The winding or reeling of the silk from the cocoons would furnish much profitable employment for intelligent and skilful females; and some of the varied services of the cocoonry would suit even the most feeble physical or mental powers. Thus, besides the benefit of gain to private individuals, the introduction of this business is likely to aid greatly the public interest, and also the cause of benevolence.

The low price of lands in Virginia, caused principally by the mania for emigration to the west, is an enormous evil. But still, as the evil exists, and has wrought its worst injuries, it is right to estimate its value, and make the most of it, as an element of the necessary investment of a silk culturist. Land here, which though poor, is easily improveable and well adapted to the growth of mulberry trees, may be bought at from less than $2, to $5 per acre. At the north, land far less productive for that growth, and more difficult or costly to enrich, would perhaps cost $20 at least; and the European culturist could not be as well provided at a cost less than $200 the acre. Thus the landed part of the capital necessary to produce a certain quantity of mulberry leaves in Virginia, would be, (even at $5 the acre,) only one-fourth the amount of the same item of expense in the northern states, and one-fortieth of the same in Europe. Skilful and trustworthy superintendents would, of course, be more difficult to be obtained at first, and therefore, would cost more here; and experience, too, must always be paid for, by losses or otherwise, in every new business. Nevertheless, the peculiar advantages of Virginia are so great, that the combined expenses of the culture cannot be reasonably expected to be greater here for the first few years, nor as great thereafter. But this estimate rests upon the supposition that equal industry and economy are brought into operation. This is manifestly necessary in every business; and without proper industy and economy being used by us, our northern brethren will have greater advantage, from their usual and admirable exercise of these requisites for success in any business, than we shall find in our better climate and cheaper land and labor.

The kind of labor required for silk-culture is just such as every poor-house would furnish, more or less of, from those who are now altogether expensive and worthless paupers. It was with these views, added to the unusually good arrangements of the Petersburg poor-house, that we urged, in vain, on this community several years ago, the undertaking of silk-culture at that establishment. Though the time has passed for the measure to produce $30,000 clear gain, as the adoption of that recommendation then would have done, by profiting by the subsequent rage for buying Chinese mulberry plants, still, for the regular and fair returns of the business, the present time is much more propitious than the former, because there is more knowledge on the subject, and better means available. The magistracy of Petersburg could not adopt any measure at so little cost as this, which would redound so much to the credit and profit of their town, and to the benefit of their country at large.

Another very great advantage is enjoyed by the eastern part of Virginia, in the abundance and cheapness of marl; which advantage is also possessed by every other place where lime is easily available. Though the mulberry tree will grow profitably on very poor and mean land, still its most choice position is on highly calcareous soil. No careful observer can doubt as to this strong preference of the mulberry tribe for calcareous soil, and the more luxuriant growth thereon.

VII. *Benefits and facilities to be expected from the use of the morus multicaulis.*

But besides the advantages peculiar to Virginia, for prosecuting silk-culture, there is a most important one which is common to the union, and will ultimately be common to the whole silk-growing world. This is the possession of the newly discovered and probably but newly produced, variety of the mulberry tree, called morus multicaulis. It is not the high market value of this plant, in mere speculation and trade, that is here meant. *That* cannot last long; and indeed that factitious value will be reduced to *nothing*, and prove as empty as any other bubble blown up by speculation, unless the plants are put to their proper use. The real value of this variety for the better and more profitable feeding of silk-worms, will prove great to every culturist of silk; and this will be increased, instead of being diminished, with the necessary decline of the enormous speculative valuation and prices. The superior *real* or *feeding value* of this variety is founded upon the following several peculiar qualities:

1st. The remarkable facility of its propagation, and rapid growth, by which the young silk-culturist may begin to feed the worms in the first summer after planting, and have his trees in a highly productive state in the second season; whereas the leaves of the most approved of the other kinds, heretofore generally used, cannot be safely plucked before the trees are five years old.

2ndly. The greater ease of gathering the leaves, owing to their large size, and the small height of the trees from which they are plucked; which circumstances together serve to save more than three-fourths of this heaviest part of the labor.

3rdly. The more nutritious quality of the leaves, by which not only a less quantity will serve for the food of a given number of silk-worms, but also, owing to their more complete consumption, there will remain less of refuse matter to be removed.

4th. The superiority of the silk produced from leaves of this mulberry to those of any other kind, which has been satisfactorily proved by accurate experiments.

These superior advantages amount to so much value, that the use of this plant might well make silk-culture profitable in a country in which it would be otherwise a losing business. The people of this country, for some years to come, at least, will have almost the sole possession and use of this tree; and even when the older culturists of Europe shall slowly admit its superiority, and obtain its full use, still the advantages will not the less attend silk-culture in general, by their being more widely diffused. Though operating to far less extent and profit, still the effect of the general adoption and use of this tree by silk-culturists throughout the world, will be like a similar extension of Whitney's cotton gin to all cotton culturists; serving to benefit every one so much, and so much to extend the market for all, that the loss of the advantage of its monopoly by one, could scarcely be perceived or estimated.

The first known plant of this variety, was brought to France from the Philippine islands, by Perottet, a French botanist. It has since been called the Chinese mulberry; and some of those who have attributed to it every possible virtue, and falsely as often as truly, have asserted that this is the kind in general use in China; and to this circumstance, they have ascribed the superiority of Chinese silk and silk-culture. But there can be no ground for this supposition; and it may well be doubted whether there is a single plant of this kind in the vast empire of China. It is a seedling variety, different from its own parent stock, and incapable of reproducing its own kind by its seeds. This being the case, its origin may as well be recent as ancient, and the plant which Perottet brought from the Philippines, and which, by its peculiar appearance, attracted his notice, without his reporting or probably suspecting its value, possibly, might have been the only individual then existing in the world. If, as has been asserted, this was the kind of mulberry tree in general use in China, it is impossible that its peculiar appearance, so different from any known in Europe, should not have attracted the attention of some missionary, or some other of the few, but intelligent and observant travellers who have had opportunities of passing through that great country, and who have published their observations. In addition, the compilation of extracts from Chinese works, before referred to, though describing several kinds of mulberry trees, does not speak of one which can be confounded with the morus multicaulis.

To conclude. If the facts, which have been stated, and the arguments founded on them, are both correct, then there can be but little ground for doubt or question of this important general deduction—that the combined advantages for silk-culture now possessed by Virginia, are superior to those of most of the successful silk-growing countries in the world, and inferior to few, if indeed to any.

ON THE CAUSES OF FAILURE OF THE CROP OF COCOONS, IN 1834, IN THE DEPARTMENT OF GARD.*

Translated for the Farmers' Register from the Annales de l'Agriculture Francaise.

The cocoons have generally failed this year in the *arrondissement* of Alais, (in Gard,) which furnishes a large quantity, and of the best quality; they have succeeded no better in the other parts of our department, and in the neighboring country. The deficiency of this crop is so much the more severely felt, in as much as it may be said to be the only one that brings us in any money.

The silk-culturists of Cevennes have great reputation, which they deserve by the labors they perform, and their attentions and watchfulness. But the greater number of them are opposed to any change of their routine; they all continue to do what they have always done, or seen done, although they are in different localities, and although the temperature varies from year to year. Thus the most skilful culturists fail sometimes. Either a laboratory badly situated, badly ventilated, the continuance of rain when leaves have not been provided in advance, or other causes, occasion diseases of the silk-worms, and may cause the failure of a particular stock. But this year, the evil has been general, and of course there must have been a common cause.

The *grasserie*, [*gras*] or *yellows*, prevailed generally in this region. Very few proprietors have been spared by this plague, which has occasioned enormous losses. Those culturists who have had half a crop of cocoons considered themselves fortunate.

Some persons attribute this disease to the [late] white frosts, which destroyed the leaves of the mulberry trees. They say that the second putting forth of leaves, called aftermath, is less suitable for the food of silk-worms. I cannot admit this explanation.

When the mulberry trees, stripped of their leaves in May and June, and the branches pruned or lopped the following months, shoot out a second time, it may well be supposed that this kind of aftermath is of inferior quality; that the tree exhausts itself by the leafing process, so forced by our industry; and that the sap is less elaborated, and in great part has exuded from the numerous wounds of the branches made by both the gatherers and pruners.

But when, at the commencement of spring, the frost affects the young buds, often it is but their outer envelopes which are blasted; and even if entirely killed, when the weather becomes mild, other buds come out in a few days. If other frosts still follow, as in this year, it is certainly a great evil; but it is more easy to nature, I believe, and costs less of vegetative force, to produce a new shoot at this season, than to again cover the tree with leaves after it has been stripped and pruned.

It is certain that after late frosts, the trees furnish fewer and smaller leaves, and that the total weight of those produced by a tree may be less by a third, or even by a half. But their constituent principles are the same with those spared by the frost. The water, the gum or resinous principle, the green fecula, the fibrous residue, are in the same proportions, in either case, if the trees are of the same kind, and in the same soil and exposure. The insoluble residue only is in smaller proportion in the young leaves.

I will add, to sustain my opinion, that some rearings of silk-worms upon the leaves called aftermath have succeeded, while some others made on leaves which had escaped the frosts, have failed. Every one has observed this, as well as myself.

It is my opinion that the ill success of the silk-worms was owing to the wintering of the eggs, and to the variations of the temperature during the hatching. I do not yet pronounce as to the sole cause of the disease (the yellows;) I propose to make, next year, some experiments to determine the point.

The yellows does not manifest itself but little until the third moulting; but the *gras*, which appears to have the principle of the other, appears from the begining of the feeding. And since, this year, all the laboratories were affected, and at each moulting the evil increased, and this distemper reigned throughout, it must be, as I said before, that the cause must be common to the whole country. I find such a cause in the temperature which we have experienced, and of which I am about to submit some details.

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* The department of Gard is one among the most southern in the olive, or the best silk region of France. It extends to the Mediterranean, at the western mouth of the Rhone.—Ed. F. R.

The winter of 1833 '4 was warmer than any has been for many years, as is established by meteorological observations kept by my father from 1802, and since continued by myself. The thermometer rarely sunk as low as the freezing point,* [zero of cent. or 32 Fahr.]; and two mornings only, February 1st. and 2nd., the thermometer was at 5 below zero, [23 Fahr.] It rose many times as high as 14 and 15 degrees [28 and 29 Fahr.] in December, January, and February. We have had delightful and very hot days for days of winter.

The mean temperature of this season, = + 9°. 98 cent. [50 Fahr.]
The mean temperature of December, = + 9°. 85 [50 F. nearly.]
" January, = + 8°. 75 [48 Fahr.]
" February, = + 8°. 80 [48 Fahr.]
" March, = + 10°. 60 [51 Fahr.]

It has frozen three times in January, five times in February, three times in March, but slightly. The first freeze took place on January 21st. The lowest point of the thermometer in open air was + 3°, [37½ Fahr.] The thickest ice that I observed in the fields, February 1st, was only 10 millimetres [about half a line, or one 25th part of an inch,] in thickness.

Rains fell but five times in January and once in February; which produced but 71 millimetres of water, [27 hundredths of an inch.] In average years, there falls four times as much in winter.

There has fallen no snow on the plains; and the snow which covered Aigonal and Lozere this winter, and served to increase the coldness of the winds which pass over these mountains, remained on them for a shorter time than in common years.

The field labors, and vegetation, were advanced more than ordinarily. Some culturists, seeing the buds of the mulberry trees about to open, put the eggs to hatch fifteen days earlier than other years. Some worms had been hatched when, from the 16th to 23rd of March, severe white frosts killed the leaves in many cantons. It was necessary to throw away the worms, and to procure new eggs, which were very dear. The end of March and begining of April, were very fine and hot weather. Some persons had sought to retard the coming forth of the worms by putting the eggs in cool places; but others continued the process of hatching. The temperature was sufficient to produce the change of color and make the eggs hatch.

Cold again, from the 17th to 19th of April, arrested the hatching of the worms, destroyed the leaves which the first frosts had spared, and the buds of the trees which had [not] perished the month before.

But few leaves are wanting in the first age of the worms, even for a considerable stock for raising. Some few culturtsts saved their worms by means of some sheltered trees. The greater number threw away part of their stock, thinking, and rightly, that if there were fewer cocoons, their price would be higher, and that, towards the close of the feeding, the leaves would be very scarce and dear. There were some proprietors who gave up this gathering entirely, to take care of their mulberry trees; and proceeded to prune them forthwith. These trees have well ripened, and are at this time very fine.

The diminution of the leaves was supposed to be fully a fourth, and yet there remained many upon the trees. In general, the crop of cocoons did not pay the expense of the leaves they consumed, although the cocoons sold for more by nearly half, than in average years.

All the culturists had observed that the eggs changed color from the second or third day, whilst, in common years, eight days are necessary. The winter, warmer than temperate, had prepared the eggs, and the first exposure to heat was enough to make them begin to hatch; but arrested at that time by cold, reanimated and benumbed anew, this alternation of life and death, if I may so express myself, was necessarily very prejudicial to the insects. The seed of a plant which should be moistened and dried many times, would perish finally; as would the eggs of a hen if set upon one day, suffered to cool the next, and so on by turns, heated and cooled. We may postpone the hatching of all eggs, and consequently of those of the silk-worm; but once commenced, it is necessary to keep up the warmth proper for hatching them.

In other years, we have been accustomed to take accounts of the laboratories which succeeded badly; but this year it was those which did not fail, which were remarked and cited. The most successful culturists were those whose eggs were wintered most carefully, who knew how to guard them from the early heats, used precaution in hatching them, in moving them and giving them air the most frequently; and those whose mulberry trees being less damaged by the frosts, could avoid protracting the feeding season.

Ch. d'Hambrer-Firmas,
Mayor of St. Hyppolyte-de- Caton, Member of the Agricultural Society of Gard, &c.

From the Farmers' Cabinet.

GRAFTING AND INOCULATING.

Grafting is a mode of propagating varieties of fruit of esteemed quality. Grafts may be cut at any time after the fall of the leaf in autumn, and before the buds begin to swell in the spring. They should be of the preceding year's growth, and are best from bearing trees and exterior limbs. They may be preserved by imbedding their larger ends in clay, a potato, or in moist earth, in a cellar in winter, or in the open ground, partially or wholly covered, in the spring. Grafts are frequently sent across the Atlantic. The great care should be, that they are not kept too warm or too moist, so that the buds swell before they are wanted for use. The rationale of grafting will suggest the time and the manner in which it should be done. The scion and graft are to be so adjusted that the sap-wood of the stock, by which the sap ascends from the roots, comes in contact with the sap-wood of the scion; and a like adjustment must be observed between the inner bark of both, through which the sap descends from the graft to the stock, after it has been elaborated in the leaves. Without the first precaution, the sap will not reach the graft, which will consequently shrivel and die. Without the last, the graft cannot knit or unite to the stock; for it is the descending sap which forms the new wood, and which indeed causes the graft to send its roots down into the earth, upon the outside of the wood, but under the bark of the stock. The union can only take place after the sap has begun to circulate in the stock, which is when the buds are bursting. The clay or composition is applied to exclude the drying influence of the air and sun, and also rain, from the wound, until a complete union has taken place. The graft does not become injured by being somewhat shrivelled before it is inserted; but if it appears too much so, it may be buried a few hours in moist earth before used. The compositions used as substitutes for clay are many. A good one is one part tallow, two parts beeswax, and four parts rosin, melted and incorporated like shoemaker's wax. If the weather is cold this will require to be softened by immersing it a time in warm water. A thin layer of this covering the end of the stock and the slit, will suffice. With the addition of a little more tallow, the composition may be spread upon linen or cotton cloth, when warm, and the cloth cut to the required size for a graft, and applied with less trouble in the form of a prepared plaster. The different processes of grafting are so generally known that we need not detail them; our object being only to throw out such suggestions as may tend to render the success of the operation more certain.

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* In the original the degrees of temperature are marked according to the centigrade thermometer, which are here accompanied by the equivalents according to Fahrenheit.—Ed. F. R.

The following is the account of Mr. Robinson, of Portsmouth, N. H., of his method of performing the operation:

"Persons intending to graft or inoculate to good advantage, should in August procure their scions containing their buts and grafts. It is well to have for their better preservation, a portion of the larger limbs connected with them. If taken off immediately, they must be thrown, when bundled up and labelled, under the north side of your thick yard or garden fence, where they will be secure, if exposed to the influence of the atmosphere; having an eye in case of too warm and dry weather, they are not too much exposed. If so, just enter their but ends under the surface of the earth. This method is better than covering them up bodily, or keeping them in a cellar.

"Experience has taught me that there is a great advantage in procuring cuttings in this way, over the practice of neglecting till too late. I shall now attempt to show the best method to manage a nursery, as to securing good fruit in the most economical and speedy manner. To do this, grafting and inoculating is my text. The nursery is supposed to have been judiciously managed, and of one year's growth from the seed. Of course the plants are from one to two feet high, and as large as a Dutch quill; some much larger. All of this size never will be more fit to bud. There should be no delay. These little young trees have their peculiarly smooth and pliable bark; they are very thrifty, and consequently may be budded somewhat later than others of a different character. A nursery in this stage may be most advantageously budded. If the operation be skilful, they will take; and if otherwise, they receive no perceptible injury. The advantages of early budding are numerous and great. First, the job contemplated is over: you cannot have any uneasiness about it from any delays. Your trees are in a much better state for coming to perfection; they will thrive much better, notwithstanding they are cut off from two to four inches from the ground during the season; they will far out-grow the others in size and height, they also grow more erect and free from craggy twigs, a great saving in pruning. The improvement in their appearance is admirable. Picture to yourself trees from the nurseries such as I have received, and at full prices, with old stocks, half closed over, and budded two to three feet from the ground. The contrast is great.

"The disadvantage from suffering nurseries to remain till a number of years old, before budded, is obvious. The wound necessary for the bud, in thick and old bark, and especially if the bud *does take*, is of some injury. The cutting off the large old stock, leaving the bud alone while the stock is closed over—meantime the quantity of roots without a top in proportion, are great checks, and of much injury to the growth of the plant; and most ultimately affect the growth and health of the tree.

"I make these remarks from the authority of my own experience in inoculating a nursery in its different stages as above described.

"I shall now attempt to describe my process in budding. I was instructed to strike a horizontal cut through the bark, with a sharp knife, at a suitable place, on the north side of the stock; striking from this a perpendicular cut about an inch long, opening the bark with a knife or some instrument for the purpose; then taking a bud from the scion, having a care to take off a small portion of wood with the bud—then carefully taking away the wood, leaving the stem or eye of the bud whole and smooth—then thrusting in the bud with a due proportion of bark, three-fourths of an inch long, and half as wide. The bark of the but to be thrust in free from the bark of the stock above—then closing over the bark of the bud with that of the stock, binding it carefully, with elm or bass rind, or with coarse woollen yarn. This process has not yet proved perfect; it has with me often failed. I have sought for a more perfect and sure process. Accordingly I have varied, as my judgment has led me, for a better method. I have found that instead of striking a horizontal, it is best to cut quite a sloping stroke, splitting down from this slope perpendicularly so slow as to admit the bud, taking off in an oval shape, in the same careful manner as above described; having a care to preserve a little wood at the eye of the bud as I had in taking it away in the former process. The bud then is to be thrust under the raised bark, down so low as to admit the bark of the stock to come in its former place, above the bud, for half an inch, where it immediately receives its usual nourishment; being bound up with coarse woollen yarn, which I prefer to any thing else. In winding on the yarn, I am careful to draw it gently over the wound, omitting to cover the bud till the last, over which I then draw the yarn very softly. In this process, every part works so natural and so smooth, that if unbound the next day, it would be difficult to distinguish the bud from a natural one; and indeed, the bud as well as the bark of the stock seems not in the least affected. In this mode of inoculating, there is no such thing as not taking. On the other hand, the bark being cut square across, and the bud not being sufficiently thrust down, the bark of the stock coming to bear on the outer bark of the bud, at the top of the slit, there is nothing to support it; but it dries and shrinks from its primitive place, admits air, and if the wood is taken out of the bud, it all fails together, especially if the eye of the bud is a little rubbed: at any rate, live or die, a dangerous wound is inflicted.

"The mode that I would recommend, is a safe and fast way of budding: it all works natural; a lad having his hand in, will put in from two to four hundred per day. I now proceed to give an account of inoculating in the spring of the year. This was an experiment, with me, altogether. In the season of grafting, I chose a few trees that were of common size for grafting; some had two good equal branches, one of which I grafted, the other I inoculated at the same time. I carefully cut out the bark of the branch where I chose to place a bud, cutting downward, turning my knife in and out in such a manner as to take off the bark in the form usually given in taking of the bud; taking at the same time so much of the wood, as to compare with the bud from the scion; and, if the first cut failed, I carefully mended my hand, until it well suited. Thus the bark being all well done, the bud was laid in, inside comparing with inside; of course a space was left on the edge of the bark of the stock not covered from its extra thickness on the old stock. The buds thus being left somewhat sunk in the stock, were then secured in the usual way of budding."

TREATMENT OF CATTLE.

From the Maine Farmer.

My experience demonstrates the fact, that where dry fodder is occasionally dealt out to neat cattle, they will drink from six to eight times per day, and I find by an examination of the stock through the country, that their good or bad condition is generally, if not invariably, in proportion to their facilities for obtaining water. Neat cattle are perhaps an exception from most animals, in their extreme nicity in partaking of their food and water, (hence the term neat). Their timidity in overcoming trifling obstacles to obtain water is no less observable. I have known them to endure thirst and cold with an apparent stoical indifference, rather than to make any attempt to pass over ice or snow drifts. I could name some persons in this vicinity who are considered good farmers, whose cattle every spring are like walking skeletons, living dead ones, mere shadows, not for any lack of good hay and comfortable barn room, but all for want of a convenient water fountain, that great restorative and corrector of dry fodder.

Before closing my hasty remarks, I would call your attention (If I am not out of place,) to one more error which I think many and even good farmers have fallen into with regard to a certain quality in a milch-cow, which they seem to think is all important in order to a good one: that is, that she should give milk until the time of her calving, and if she but possesses this quality it is to them a sufficient recommendation, if they wish to make sale of her, and that it is the great and only criterion by which to judge of a good or poor cow.

Now sir, so far as my experience goes, it is at variance with this argument, from the facts that cows that are milked to near the time of their calving, will not give so much nor so good milk during the year; as being milked at an unseasonable time, they loose much of their vigor and strength at a time when most needed—their bags do not have their natural fullness—their calves come weak and puny, and consequently are not worth so much, and that it is not possible by any subsequent keeping of the cow, to bring to a condition to give the same quantity and quality of milk, which she would have produced had she gone dry some two or three months.

With much respect,

I am yours, HENRY BUTMAN.

Dixmont, Feb., 18, 1839.

PROFIT OF IMPROVING POOR LAND.

To the Editor of the Farmers' Register.

Fairfax county, Va., Feb. 12th, 1839.

Dear sir—The first number of the 7th volume of the Farmers' Register, like the preceding volumes, has safely come to hand, and herewith you will receive a check for my subscription for the current volume of your most valuable Register. I also send you a memorandum from my *log*-book, not in any vain boasting spirit, because although the results therein stated are rather large for Virginia, and especially for Fairfax farming, still many of your readers north of Mason and Dixon's line, may be not a little amused at the self-complacency with which I send forth results, which, among them, would be deemed unworthy of record. But it is not the well, it is the sick, that need the physician. It is not the thorough practical farmer, whose highly improved lands already return him 50 or an 100 fold, who stands in need of advice or example to stimulate him to still greater exertions. But it is the great mass of Virginia farmers who, like myself, have poor and exhausted lands to operate on; lands which, in their present impoverished condition, are scarcely capable of supporting the labor necessary for their cultivation. Hence, in many instances, they are abandoned by the sons and daughters of the Old Dominion, who flee to the far west, in search of rich lands; which, to be sure they find, but with it, the yawning grave stands ready to receive the mortal remains of a moiety at least of emigrants; who, had they have displayed but half the energy, and have expended in *manures*, judiciously applied, less than a moiety of the cost of removing to the south or west, might have found themselves in possession of fruitful farms in the land of their fathers; surrounded by all the comforts and pleasures which flow from health and competency, and the enjoyments of society with which they had mingled from the hour of mirthful youth to the noonday of manhood. Is this mere fiction, a picture of fancy, or are such enjoyments real?

Are they not worth one small effort to secure them? for one I say they are real, and are worth an hundred times what they will cost to obtain them. I have tried it, and may now speak advisedly. The first steps toward it, are to cultivate *less* land and *do it better*, collect and apply at proper times, and in *due season*, all the manure that can be raked and scraped about the premises. If your land is deficient of calcareous matter, supply it either by the application of lime, marl, or bone-dust. Cost what it may, *it will repay you*, and with double interest, and although your means may not admit of your improving more than one single acre the first year, the increased products of that acre will enable you to improve two the second, and from those two you may improve (with the help of the first one) six the third year, and twelve or fifteen the fourth year, and so on progressively. For if it be true, that money makes money, so too, in a pre-eminent degree, does manure make manure, for there is no *usurious* law to limit the interest which the farmer may draw from his manure *bank*.

I was thirty years of age when I commenced farming, and I affirm that no regular farmer in Virginia ever commenced under such appalling circumstances as I did. In 1819 I found myself in possession of 140[*] acres of land, one half in wood, the other in hen-grass and deep gullies, without a pannel of fence or a building of any description on it, and without a *wheel-barrow* load of manure or any thing to make it of. 'Tis true, I was in the receipt of about $700 a year from another source; but what was that when compared with my wants? Houses to build, laborers to hire, feed and clothe, farm to stock, myself with somewhat extravagant habits to support, &c. &c.; in short, every thing to buy, and *nothing to sell!!* and what was worse than all, discouraged at every step by my neighbors, who, mostly affirmed, that Fairfax land could not be improved; and some went so far as to say, that clover and plaster would even impoverish it, whilst others declared that plaster-of-Paris would not act at all in *Fairfax*, to which my general reply was, "*I'll try it.*" I was adrift in the world, without any spot on the wide earth to which I could point as my *home*. I had to choose between the life of a wanderer, wasting my little income in hotels and boarding houses, or in struggling against the thick array of difficulties above enumerated, in endeavoring to build up for myself a home and a resting place in my own native land. I chose the latter, and I rejoice in the decision, and a kind providence has smiled upon my exertions, and spared me to enjoy the fruits of my labors, which have not altogether been lost, *(though often injudiciously applied) even on Fairfax land.* To what *extent* I have succeeded, it would not become me to say; suffice it that my farm on which I reside in the enjoyment of wife, children, and friends, has grown from 100 (for I sold 40 acres of the original wood lot, to get money to help along with) to 420 acres, including the 40 sold, which I have since bought back. The whole amply stocked with the choisest varieties of fruit-trees, all planted by *my own hands*. The arable land is in *good heart*, some of it upon which I have applied lime, only commenced with six years ago, is first-rate. Buildings[*] to the amount of ten thousand dollars have been erected, and of live-stock, and agricultural implements there is an abundant store. And next to the comfortable provision which I have thus made for the accommodation of my family, when I am no longer present to supply their wants, is the satisfaction of seeing the success of my experiment not altogether unheeded by my neighbors, who begin to think that Fairfax lands may be improved, though some are not yet quite sure that the experiment may not be a little like the Indian's gun, "cost more than it will come to." To such I would say, try it for yourselves, begin with a single acre if no more. Others there are among us who will not improve their land because their taxes would increase as the *intrinsic* value of the land is enhanced! This I assure you, is a weighty argument with some, especially with the tenantry, whose rents would also be increased if they should improve; and in the *total absence* of any legislative encouragement to the agriculturist, this rule of taxation has something the appearance of imposing a fine on a man *for improving his land!*[†]

THOS. AP C. JONES.

Product of ten acres of land on the Sharon Farm, in Fairfax county, Va., improved by liming and manuring, for the year 1838.

Five acres of wheat produced 117 bushels, at $1. 60,	$ 187	20
Straw of the same,	28	25
Three acres produced *eleven tons* 16 cwt. of cured clover hay, worth on the farm 50c. per cwt.	180	00
Clover seed from the same ground, 2½ bush. worth now $15 00 per bush.	37	50
Rye—the straw from one-fourth of an acre,	12	00
Three-fourths of an acre in sugar-beets, ruta baga, carrots and turnips—not more than one-fifth of an average crop, in consequence of drought, but according to present prices worth $75 00,	75	00
Fruit and cider sold from peach and apple trees growing on the above land,	251	50
One acre of turnips, gross amount, as per statement No. 1, (below,)	255	20
Apples and cider and other fruits consumed at home, and what remains on hand at this time,	86	00
Five pigs raised in a pen, and fed on grass and offal fruit from the above ground, and kitchen slop, killed at ten months old, weighed 784 lbs. at 8 cents, is $58 72 deduct two bbls. of corn for last feeding, } 8 00 50 72	50	72
	1,113	87

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[*] This lot of 140 acres was designated in the division (by which it fell to me) of a large landed estate, by the commissioners, as lot No. 8, "Poor Hill."

[*] It is not to be understood that these buildings have been erected, or the additions to my land been paid for *directly* out of the proceeds of the farm. But the farm affording me a living, has enabled me to apply other resources to these objects; which, without the farm, would have been exhausted in the *current support* of myself and family.

[†] The county assessor, acting under a law of the last session of the assembly, has added just 100 per cent. upon the value of my *land;* of course I shall have to pay double taxes; but I don't consider myself much the worse for it, seeing that my products have increased in a much greater ratio.

One thousand one hundred and thirteen dollars and thirty-seven cents, from which I leave the reader to make his own deduction for the year's expense of cultivation and marketing. This much I affirm, that no acre of the above land, except the one in turnips last year, has ever cost $15 to improve it, and that every acre has paid me from $25 to $50 annually since the lime and manure were applied; always doubling or *trebling* the cost of improvement the *first* year.

Dr. One acre of Fairfax land in acc't with The owner. Cr.

1838.	To saleable value of the land $8 00,	8	00	1838.	By 187 bushels of turnips, sold in Georgetown and Washington city, at an average of $1 10 per bush. is $205 70.	$ 205	70
	60 bushels of lime at 12½ per bush.	7	50		By 40 bush. consumed by the family,	44	00
No. 1	Paid for hauling the same 8 miles, 3 c. per bushel,	3	75		By 5 bush. reserved for seed,	5	50
	25 bush. bone manure,* bought in Roxbury, Mass. at 35c. per bush. $8 57 Package, freight, hauling, spreading, &c. &c. 3 75 $12 50	12	50			255	20
	Ploughing, barrowing, rolling, hauling and spreading manure from farm-yard, turnip seed and after-culture, including three bushels of plaster-of-Paris	9	40		Present value of the land, say $50 00	50	00
	Cost of marketing the crop,	12	00			305	20
					Per Contra,	53	15
		$ 53	15			$ 252	05

*This is my first improvement with bone manure; and it will be seen that it constitutes the heaviest item of expense in the above table; equal, and even greater results might have been secured by substituting manure made on the farm for the bone manure. The labor, and all other expenses, I have set down at the highest rates and cash prices, although performed by my own hands and teams, so that in fact, the lime and plaster constitute the only absolute cash expenditure to which the farmer is subjected in improving his land about here.

I have made various applications of the bone manure to grass and grain seeded last fall, and shall continue them through spring. If I am spared to see the results, they shall be communicated to you in due time.

Two hundred and fifty-two dollars and five cents, the net proceed of *one acre* of land in a single crop, in return for $23 75 laid out in *manure*. *The cash expended was not sixty days out of pocket.*

It is proper here to remark, that owing to the unprecedented drought, turnips were very scarce in market, and were consequently unusually high. From the same cause, however, my crop was not half of an average one in quantity. I have made in a very good season 600 bushels per acre, and 450 might be considered an average crop; which, at 37½ cents per bushel, a fair average price, form data by which the turnip crop in this vicinity may be correctly estimated.

THOS. AP C. JONES.

Sharon, near Prospect Hill, Fairfax Co. Va. Feb. 12th, 1839.

[It is seldom our usage to accompany the communications of correspondents with a commentary of encomium; and never merely for the purpose of paying personal compliments to the writers. However well deserved such praises may be, and much as our feelings may urge the expression of approbation of such articles, and of thanks for the service to our publication thereby conveyed, still, for several and obvious reasons, we have deemed it best, and have throughout so acted, to leave our readers to judge for themselves of the degree of excellence of communications, and of the value of their contents. It is only when some opinion therein stated requires especially to be noticed, either for explanation, recommendation, or dissent and reprehension, that we deem it necessary and proper, and in no manner disrespectful to any other of our contributors or readers, to offer comments of our own. On this occasion we cannot refrain from calling attention to the uncommon and valuable facts stated above—and still more to the circumstances under which the improvements were made; because these circumstances, even more than the results, prove that hundreds of thousands of acres in Virginia, may be highly improved, and with great profit, which have served merely as places of temporary sojourn for individuals or families, until they had spent their estates, and taken the next movement, to the western wilderness. We allude more especially to the country which surrounds each of our towns, and is near enough to supply their markets. Commodore Jones' farm is so far removed from one of these, that few individuals so situated would have thought of using it as a vegetable market; and still fewer as a source of supply for manures as heavy as lime. Yet who, among the most sanguine, could have hoped for more improvement of soil? Or who, among the most avaricious, could have required more clear profit in farming, than he has achieved? If the position of our correspondent should be even considered as on the utmost verge of the territory improveable by vicinity to towns, still the circle around each would be 18 miles in diameter, and the whole space so improved would yield net agricultural profits surpassing those now derived from one-third of the state. Besides, in each of these circles, half the proprietors would have means and facilities far better than those of our correspondent, either in closer vicinity to the market for sale of products, and the source of supply of putrescent manures—of water carriage—or of beds of marl, on the spot, which would save the most costly, and yet the most profitable expenditure which he has incurred, for the purchase of lime. Yet these parts of our country surrounding the towns, so susceptible of profitable improvement, are, with a few rare exceptions in particular farms, among the poorest in the state. Especially around this one, Petersburg, and even within the distance of the farm of our correspondent from his market, there are lands having ten-fold advantages for improvement, and which would now sell for $6 the acre, and which bring no real profit to the present cultivators even at that price of purchase, or valuation of capital. Yet there is marl either on, or not distant from these lands, and the richest of putrescent manures in the town, which may be bought for 25 cents per load of 20 bushels; and of which nine-tenths rot in the town, and serve only to poison its air, because the neighboring farmers will not move them away at that low price, or even if given to them. There might be secured, within six miles of this town, independent fortunes for one hundred improvers like our correspondent, on tracts of land which now yield little or nothing to their cultivators.

But to all this the answer is ready, from every one who is thus neglectful of the means proposed: "If all within six miles of Petersburg, or even of the more populous town of Richmond, were to pursue this course, the markets would be soon glutted with supplies from the land; and the now plentiful and cheap sources of manure would be used up, without supplying half the demand." So it might be, if *all* were at once to adopt the same course of reform and improvement. But no such fortunate and general and simultaneous change is to be expected, or hoped for; and for any number who *will* take the course recommended, there is no danger of their wanting either the proper supply of manure, or the demand failing for their products. And if, in the earliest possible time, every farmer within ten miles of Washington, Richmond, Fredericksburg, Petersburg, and Norfolk, should improve his land and increase his products as much and as rapidly as Com. Jones has done, there can be but little question that their markets, both for sales and purchases, would grow as fast as their own improvements. The very poverty and unproductiveness of the adjacent country, and the consequent scarcity and high price of supplies to the markets, is one cause that retards the growth of the towns; and even though a better supply of the markets might reduce prices somewhat, yet by making the demand larger and always certain, the suppliers would, on the whole, be better rewarded than now.

It would be one of the greatest of blessings to Virginia if her other own native-born sons would generally do as this one has done; but if not, it would be the next in value if some hundreds of the more industrious, prudent, and economical Yankees would come and colonize the agricultural wastes which are to be found within a few miles of each of our towns, and profit fully by the resources which the present proprietors neglect, and suffer to be totally lost.—Ed. F. R.]

From the Franklin Farmer.

EXPERIMENTS OF GEN. JAS. GARRARD WITH VARIOUS GRASSES.

To the Editor of the Franklin Farmer:

Sir—Upon the subject of grass, I have found no such essay or notes as you suggest, was left by my farther; he may have left such essay or notes, and should I in future find any, you shall have the full benefit of the same. As to my being able to treat the subject with that justice which its importance demands, I feel myself quite incompetent to the task; and not knowing the manner or design of the committee, I am unable to communicate what little knowledge I have upon the subject, so as to be of much use to them. Some of my father's experiments with grass, were made before I was of an age to notice or feel any interest upon the subject. He tried several varieties of grasses, among which were timothy, blue grass, clover, (three varieties,) orchard grass, red-top, meadow-oat and rye-grass, the last of which grew only from spring until winter and was killed by the frost, from which I conclude it could be of but little use in this country although held in high estimation among the farmers of England, from whom he procured the seed when on a visit there. Red-top is suited only to low, wet, marshy land, and having but a *small* portion of such on his farm, he made but a partial trial as to its *qualities*. It yields very abundantly and is a good hay when put upon land that suits its growth. Upon high lands it will not do so well as low, wet marshy lands—this, I think, from the trials I have myself seen made in Kentucky and Ohio. Meadow-oat he tried and thought well of as a grass to make hay; the greatest objection was to the time when it needed cutting, which was when the corn-crop needed undivided attention. It has the advantage of being cut the second time of good seasons, with a good yield, and answers very well to be mixed with red clover—both ripening at the same time, and being well saved, makes an excellent food for cattle and horses. Red clover he tried as a hay grass; he admired the hay, but owing to the difficulty of saving, together with the disadvantageous time of saving, he abandoned the use of it for that purpose. The white clover is well known, and is inferior to the red, for the various uses of that grass. The scarlet was a variety which he procured in France, while on a visit to that country; it was the prettiest grass I ever saw, but the winter killed it as it did the rye-grass. Orchard-grass he did not like for a meadow-grass for several reasons; it was equally objectionable with the meadow-oat and clover, as to the time of cutting—it grows too much in detached sods and does not sod completely the ground—the hay is too coarse and rough—cattle and horses are not as fond of it as clover or timothy; but for a pasture grass he admired it particularly when sown with other grass. It is much earlier than blue grass, timothy or clover, and affords grazing at a season when it is most needed, and upon the whole he thought it a valuable grass. Timothy he preferred as a meadow-grass to either of the others which he tried. He tried sowing at two different seasons, and on different kinds of land. He objected to spring sowing on two accounts; one was the difficulty of getting the ground in a suitable order to receive the seed; and another was, if any weeds were in the ground, they grew up faster than the grass and injured the meadow. He preferred old land for meadow, it being less liable to have weeds, and the grass not so liable to fall; and from the different trials he made, was of the opinion that one season with another yielded a better crop, and furthermore, you were improving land that most needed it. He also tried fall sowing in different ways, with and without grain, with grain, (usually wheat,) he first prepared the ground very nicely by ploughing and harrowing, and, sowing the grain and leaving the ground as level as possible, sowed the timothy seed and did nothing more. The objections to this mode of making meadows are two-fold—1st, It is one season before you get any benefit of the grass, and another is, the timothy goes to seed before the wheat is cut and the heads of the grass are cut off in cutting the wheat which usually causes your grass to be too thin; likewise the stubble is very much in the way in mowing the next year. He preferred preparing the ground well in the month of September and sowing the seed and then rolling the ground, which broke all the clods and leveled the ground, which is an advantage in mowing. He preferred sowing it much thicker than is common among farmers. A gallon to the acre is what is generally used; a peck is nearer what should be used. By sowing in the fall, and sowing thick, you at once sod your land and are enabled to derive full benefit from it the next season, and in addition, it keeps the weeds from growing up in your meadow; whereas the usual idea is, sow thin and let your grass-seed get ripe before cutting, in order to set your meadow more effectually; by so doing, all the vacant spots of ground most certainly grow up in weeds, thereby injuring your grass, and finally your meadow. The primary object of grass in this country is for grazing purposes; for this purpose we wish to put two kinds of land in grass—our new or wood-land, and our old worn out lands. Our old lands we usually sowed in wheat or rye, and then in March, when the ground is thrown up by the frost, we sowed a mixture of timothy, blue grass and clover, and of late mixed some orchard-grass, which is, I think, very advantageous. In this way the grain protects the grass from the heat of the sun, and by the time you wish to turn upon your stubble, you reap the benefit of the stubble, and at the same time knock the seed off your grass and more effectually set your ground. Some difficulty is experienced by Kentucky farmers in getting their wood-lands set in grass, and it arises from two causes—the time of sowing, and the grass being pulled up by the roots by the stock in grazing. The last is the cause of the general failure in putting our hill-lands in grass, as a remedy for which, I would suggest two means—1st, Sow your grass as soon as you save the seed, say in July or August; at that time the leaves of the former year are sufficiently rotted for the seed to germinate and grow; the trees likewise furnish shelter for the seed, and by fall, your grass has begun to take root, and then the falling of the leaves furnishes a protection to the young grass during the winter, and enables the grass to take root sufficient to keep the stock from pulling up the sods in grazing. All stock should be kept off until your grass seed is ripe, and then turn on as much as the grass will support for two or three weeks, which is as long as it should be grazed the first season, or at any rate until late in the fall. We generally sow some timothy and clover seed the spring following the sowing of the blue-grass, but I think the fall would be best for sowing the timothy, for the same reason advanced in relation to the blue grass.

Let those who doubt the philosophy of the above remarks relative to sowing grass, *try it for themselves*. Should you, or the committee, be able to glean any thing from the above remarks, that they or you may think, could be of any benefit to the country, I shall feel myself amply paid for the little trouble it may have put me to, in the reflection that I have thus been instrumental in communicating such information.

I remain, your ob't, serv't.,

Chas. T. Garrard.

Bourbon County, Ky., Jan. 15, 1839.

THE ADVANTAGE OF STEAMING FOOD FOR STOCK. CULTIVATION OF CORN.

To the Editor of the Farmers' Register.

King William, February 1839.

I have been using the root-steamer described in the Cultivator, of January 1838, for the last 12 months, and am so much pleased with it, that I cannot refrain from adding my testimony in its favor, and recommending it to my brother farmers. Mine was made by directions given in the Cultivator and has fully answered my expectations. My method of using it this winter, when, from the dry summer and fall, we had so few vegetables, has been as follows. When fattening my hogs, all the corn they consumed was steamed until it became perfectly soft upon the ear, which, of course, saved the trouble of shelling and the toll of grinding. Upon this food almost exclusively, with the addition of a few vegetables which we could spare from the garden, steamed with the corn, I fattened my hogs, and never had as fat hogs before, or as cheap pork. The corn, in steaming, increases nearly double in quantity, and I think a saving of at least one-third may be calculated on. After my hogs were killed, we began to steam for beeves, milch-cows, hogs, and horses. My plan is to put a sufficient quantity of shattered corn for my hogs in the bottom of the boiler, then ears of corn for my horses, short corn, cotton seed, vegetables, &c., for my cows and beeves, and then fill up with shucks, or any other coarse provender for the oxen. The shucks, from steaming, become very soft, and are greedily eaten by cows and steers. The shattered corn, together with the liquor in the bottom of the boiler, I have found excellent food for sows with young pigs. I would recommend the use of steamed-corn for horses as the most economical mode of preparing it, I have tried it particularly for old horses, and have no doubt from an experiment I have made in fattening a very poor horse, that it is equal to any food for that purpose. The trouble of shelling and sending to mill, as also the toll for grinding, is saved on this also, while the quantity of food is increased by the cobs which are all eaten by the horse. I believe a saving of one-third or one-half may be made in feeding horses on steamed-corn, as well as hogs. Some farmers will say this steaming is too troublesome; but I can assure all such, they will be amply paid for all trouble and the small expense attending it. The consumption of wood is very inconsiderable; and with the attention of a small boy, I am enabled to save one-third of my provender, increase my milk and butter, and keep my horses, oxen and hogs, in good order. We use the boiler or steamer also to heat water to kill hogs, and other purposes; mine holds about 35 gallons.

After seeing your remarks upon the Chinese corn humbug, I took the trouble to count the grains upon one stalk of my Maryland twin-corn. The product was 3500 grains from one; 1400 more than the Chinese, if I recollect it aright. I would be glad if I had an opportunity to send the stalk to Mr. Thorburn, of New York. I am still pleased with this variety of corn, and shall plant no other this year.

My present method of cultivating corn, is the following: The 11 feet old wheat beds are broken up in the fall by reversing them with a double plough, well harrowed, and sometimes re-ploughed in the spring. With a small plough we run one furrow on each side of this bed, say two and a half feet from the centre, so as to have the two rows upon the double bed five feet apart, and allow six feet in which to have the water furrow. In these furrows the corn is dropped, say 18 inches on rich or manured land, and two feet on the poorest parts, and cover with a double-horse harrow. The cultivators are immediately started and continued until the corn is large enough to thin, when we run the same double-horse harrow with the front and hind tooth taken out immediately upon the corn. I believe this to be more beneficial than any other working given the crop, it breaking and pulverizing the hard ridge of land between the hills effectually, which no other implement could do by horse-power. The hands follow immediately and thin, which is very easily done, and set up the stalks which may be mashed down. Then cultivators again until just before harvest, when the dirt is thrown to the corn with small ploughs. Some of the advantages of this system are these: It is easier to reverse eleven feet beds than to list upon them, as you always have a furrow ready to receive the land. The corn-rows are uniformly high, whereas, when listed, you have a high and a low bed alternately through the field. The harrow works much better on 11 feet than on a 5½ feet bed. We save all hoe-work, I did not hand-hoe a single row last year, and made something like 60 barrels to the hand, on land of medium quality. The harrow we use is very simple, consisting of four pieces framed together in a square, braced in the corners, and has teeth only on the circumference; they run deeper, and consequently pulverize the land better than those having teeth in the middle, or in every cross bar.

EDWARD HILL.

From the Maine Farmer.

BREED OF SWINE.

Messrs. Editors:—I have been for many years engaged in raising hogs and making pork, and am fully convinced that much of the profit of that business depends on the breed. "The old fashioned, thin, long legged, long nosed, gaunt bodied" kind, are hardly worth keeping. They are continually uneasy and squealing, feed them as much as you will. This kind, however, is fast disappearing and their place being supplied by those that are better; among which the Bedford will take the first rank. This breed was introduced into Massachusetts, several years ago, and Oliver Fiske, of Worcester, who has much experience in the business of raising pork, says "experience has proved to my satisfaction that the Bedford breed is far the best that has been introduced into our country. They are quiet in their nature, fat easily, and with little expense or trouble. I have had them at 12 months old weigh 340 lbs. and a considerable number at 18 months old 400 lbs."

Levi Lincoln, late Governor of Massachusetts and President of Worcester Co. Ag. Society, has given his opinion of this breed of hogs, in the following language:

"I have great pleasure in voluntarily offering myself as your compurgator in the representations with which you have recently favored the public, of the Bedford breed of swine. The care and perseverence which have marked your attention to the prospects and value of these animals, and the success which has followed your exertions to introduce them to the favor of *practical* farmers, require, at least, an acknowledgement of obligation from all those who have been particularly benefited by your liberality, and from no one more than from myself. This breed of swine has taken the place of a long legged, long nosed, flat sided, thriftless race, called by some the *Irish* breed, by others the Russian, which would barely pay by their weight for ordinary keeping, and never for one half the expense of fattening, if, indeed, grain would make them fat.

"I had three pigs butchered from the same litter, precisely seven and a half months old. Their weights, when dressed, were 230, 235, and 238¼ lbs. One sold in Boston for 6¼ cts. per lb.; the others were put up here for the family use. The expense of keeping and fattening these pigs, I am satisfied, was less than with any other breed I ever raised, and the proportion of bone and offal to the valuable parts, was surprisingly small. I have fifteen more on my farm, part designed for the market in the spring, and part to be kept over as store swine, and their appearance will furnish ocular satisfaction of the propriety of all which has been said in favor of the breed."

A pair of these pigs was first sent to this county by the duke of Bedford as a present to General Washington, by a farmer by the name of Parkinson, who resided near Baltimore. Instead of delivering them to the General, he sold them. The first that came into Massachusetts were sent by Gen. Ridgly of Pennsylvania, to Col. Pickering of Salem, who has taken great pains to preserve the breed pure, and introduce them among the farmers of that state. Mr. John Reed of Roxbury, obtained them from Col. Pickering, and Mr. Fiske of Worcester, had them from Mr. Reed. In 1835 Mr. Sandford Howard, who then lived in Hallowell, purchased a sow and I purchased a boar from Mr. Rowland Howard of Easton, Mass. who had them from Oliver Fisk. All the hands through which they passed, from their first introduction into this country until they were brought to this town, are careful breeders of pure stock, and much pains has been taken to preserve this breed pure, and avoid breeding in-and-in. That is, propogating offspring among the same litter. No reasonable doubt can therefore exist but that the breed was introduced into this state in its purity.

Since I have had them, I have found them to fully sustain the reputation given to them by the breeders in Massachusetts. They are very small boned, in proportion to the size. Quiet, easily fatted, do much better on raw food than any other kind, and obtain a good size at an early age.

I have crossed the pure Bedford with the ½ Bedford and half Macky, making the progeny ¾ Bedford and ¼ Macky, but found very little advantage from the crossing. One of these pigs I wintered last winter on 8 lbs. of raw mangel wurtzels per day, and she kept in good condition, and brought a litter of 10 pigs in April, a few weeks previous to which, I fed her on the slops from the house. Nine of the pigs lived, and made fine hogs. During the summer she lived principally on grass with a few raw potatoes, and in October she had another litter of 13 pigs, four of which, however, owing to an accident, died. She was then kept on boiled pumpkins, oats and peas, and barley-meal. Since then, she has lived entirely on raw ruta baga and mangel wurtzels, at the rate of about 12 pounds per day with an opportunity to burrow on the manure heap, and is now in good condition.

I killed one of the pigs which was ⅞ Bedford and ⅛ Mackay, when nine months old, that weighed 302 pounds. He was fed on the slops from the house, during the summer, and the last two months was fed on meal and corn. When I first commenced feeding him on meal he ate about two quarts per day, but after 5 or 6 weeks he would not eat more than one quart. He gave the most meat in proportion to the bones, of any hog I ever killed, and I think was the cheapest raised. Others who keep this breed have made the same statement. There was one of the pure Bedford breed killed in the neighborhood 14 months old, that weighed 385 and another 18 months old, that weighed 420 lbs. neither of which had any extra keeping.

Between the 20th of March and last of May, I shall have 14 litters of pigs, two of which will be the pure Bedford, and two will be ⅞ Bedford and ⅛ Mackay, with which I can supply any persons who may be in want.

Any persons who are desirous of examining this breed of hogs can do so by calling at my farm, about 2½ miles from Hallowell Vilage.

J. WINGATE HAINES.

Hallowell, Feb. 13, 1839.

From the London Gardeners' Magazine.

WEEDS AS MANURE, AND VARIOUS REMARKS.

Sir,—From reading the review of Cruikshank's Practical Planter in your vol. p. 448, I am led to make a few straggling observations. The system I advocate is equally applicable to horticulture as to agriculture. Cruikshank says, as quoted by the review, (p. 453,) "It may seem a very paradoxical fact, but it is nevertheless true, that wood, instead of impoverishing the ground on which it is produced, nourishes it." (To be sure it does.) "There is very little of our waste land, that if trenched or ploughed will carry even a moderate crop of grain, unless it receive a considerable quantity of manure. After bearing timber, however, the contrary is found to be true." So the old vague, unphilosophical, unmeaning, foolish theory of rest is demolished at last, or rather explained. His subsequent reasoning is bad. Farther on, (p. 454,) he says, "That the soil should be enriched by the production of wood, when the experience of ages has proved that it is always exhausted by other crops, will seem to them a paradox of the most extravagant kind." By this statement it does. But other crops are carried off annually by man or beast, root and branch. This I shall explain. Cruikshank's theory is not confined to wood; it includes all vegetation. This is a truth as palpable to every one, when pointed out, as the rotundity of this globe, or the simple act of Columbus' making the egg stand on end; yet it is no less lamented than true, that notwithstanding all the splendid talent which has been exhibited, from Tull to the present day, this very obvious fact should not have been long ago adopted as a fixed and leading principle in all agricultural and horticultural operations. It stares us in the face in the forests and prairies of this country, the pampas of Buenos Ayres, the dirty summer fallows of England, and every where and in every thing. The principle of a clean naked fallow (fortunately a rare occurrence,) is utter annihilation. Had farmers and gardeners been able to eradicate weeds as they are called, the soil would have been a *caput mortuum* long ago. But weeds—like the principles of liberty—destroy, hack, hew, and persecute as we may, rise again in due time, not to injure, but to fertalize and benefit. We must follow nature; all other guides are fatal *ignes fatui*. "He that made the earth gave it laws that 'tis not good to break." After much steady observation, thought and practice, for some years past, I am perfectly convinced that all applications, no matter how large, of animal manures, animal substances, and minerals, are comparatively nugatory, without profuse supplies of vegetables and their roots; and I am not sure that an occasional liberal dressing of wheat flour, Indian corn-meal, &c. would not be the most profitable manure of all. Lions and tigers prey on flesh; and the vegetable monarchs of our forests attain their highest majesty on vegetable food, and in due time, return again to the soil, to produce increased fertility. This is very obvious on the banks of the Ohio and Mississippi; and vast masses too, of drift wood are carried into the ocean every flood. Does all this timber grow and die to no purpose? What is the man's religion who says it does?

The second extract from Cruikshanks is by no means a correct statement. If wood-lands were kept clean, and all the leaves and dead branches carried off, the trees grubbed up root and branch, again replanted, and so on, the soil would eventually become as barren as any cotton or tobacco plantation in the southern states, and that is poverty with a vengeance. The cause of this is obvious; but not to the planters. They say it is the tariff. Oh! for the school-master! The fact is, when wood-land is cleared in this country, the crops are often very moderate until the progress of decay has brought the roots into action. I will illustrate this farther. The general system of farming in this state is, Indian corn, often very foul—oats, (a wretched crop in this hot climate,) or barley—then a very moderate dressing of manure, and a bountiful crop of weeds are ploughed in, producing a very fair crop of wheat, much better than the skill of the farmer deserves. The crops obtained are not at all warranted by the quantity of manure applied. Clover and timothy for two or more years, and often as long as it will mow and pasture, then Indian corn again, and so on. The old sod is usually ploughed in the spring, then corn planted in May. For some time it exhibits a very sickly yellow and poverty-struck appearance, until the green roots and weeds begin to decay; it then grows with great luxuriance and beauty. If after wheat, the land is ploughed before the weeds can grow, and sown with buckwheat in July, which is a very clean crop, the succeeding crop of Indian corn is very poor. Further, Cruikshank says, "Trees draw their nourishment from a much greater depth than any of the grasses, roots, or different kinds of grain." I doubt this very much as taking place to any extent.

He would infer that trees fertilize the soil, not by adding any thing to it, (except leaves, &c.) but by not taking any thing from it. The great bulk, nearly the whole of all the trees' roots, I have seen many, are within two feet of the surface. It is their decay which enriches the soil. They exhaust and then enrich. I lay no claim to the original discovery of this principle: it has been loosely hinted at and described by various writers; but I think I may venture to say, that I am the first farmer who has employed it in his rotation of crops; and I will venture to say, that at no distant day it will entirely change the present results in the best system of agriculture, especially in hot climates. I have had, and have several pupils, young men of talent and capital, well convinced of the truth of what they have learned, and competent to practise it. As with all improvers, a due proportion of sneers, scorn, derision, and ill-will has fallen to my share; and, as usual, those who know, observe, and ask the least, talk the wisest and most learnedly. To the want of vegetable food, I entirely attribute the frequent failure of grass, clover, turnips, saintfoin, &c., in England, and under the improved system of farming; and the cleaner the land is kept, I suspect the more they fail. To say the land is tired, proves something is wrong, but explains nothing. I am quite satisfied that the crops under the old wretched system of farming, were much better than under the new, in proportion to the manures, skill, management, &c., applied in both instances. Weeds, misplaced except in summer fallows, were the old farmer's salvation; but he did not know it. Weeds do not rob the soil; they either enable the farmer to do so, or prevent him, as the case may be; they keep up the fertility of it; they rob the crops, but not the soil. I see it often mentioned in your magazine as a great advantage to leave fruit borders uncropped; this is not nature's way of proceeding; and those who do not follow her laws make sad work of it, sooner or later. I should greatly prefer sowing them with clover, grass seeds, turnips, lupines, borage marigolds, or even weeds, yes, weeds, the vile things, &c. &c., manure and top dress them, and dig them in half, full grown, and ripe. I do so in my garden with great success. I shall not now say much of my own farm, as any detailed account would be unintelligible and unsatisfactory, for many reasons, and not altogether belonging to your journal. My present purpose is to direct the attention of horticulturists to vegetable manures. Nine years ago, my farm was almost a *caput mortuum*, owing to unusually bad management long continued. One of my neighbors, a farmer by intuition, a Minerva-born, learned at all points, said lately to one of my pupils, "It will be so again in five years." Query—if this system has put my farm on the road to matchless fertility from utter exhaustion in a few years, by what scorpion process is it to destroy it in five more? Have you any Minervas in England now? They are far more plentiful here than rattlesnakes, and far more mischievous: the latter bite only when injured. I have reached 70 bushels of Indian corn per acre; next year I fully expect 100 or more. Indian corn rather exceeds beans in England, the land being equal. I raise finer crops of Swedish turnips here than I ever saw in England or Scotland, or grew myself in England. They have never once failed in the nine years. I sow them after wheat and barley, the same season. My farm is 100 acres; about 75 under the plough: the rest in grass. My rotation is 8 years, growing in that time eighteen to twenty crops, (in the southern states much more might be done,) above one-half harvested, and the remainder ploughed in; all the rest is in strict accordance with English and Scotch principles. I have now growing the fourth crop this season on some of my fields. It matters not what crops we grow; it is the use we put them to that does good or evil. I shall make this season yard-manure sufficient for 45 or 50 acres. I could manure my whole farm annually by eating all my Indian corn, (18 acres,) and not selling any straw, (next year I begin to sell it,) with 18 acres of turnips and other crops. This could hardly be done in any country in which Indian corn will not grow, with turnips as a second crop. This system leads me to the belief that all crops are exhausters and improvers, (independently of their subsequent application,) just in proportion to what they take out of the soil, (if one crop really takes more than another,) and what bulk and quality of roots they leave behind. This I take to be the true solution of the old doctrine of rest, which signifies an accumulation of vegetable matter in the soil, which, when man destroys, barrenness is the result. Clover is considered one of the best improvers, and so it is; yet it is one of the greatest exhausters, until its roots are decayed, as are all grasses and green crops. I have top-dressed clover in the spring with yard-manure; mowed the first crop; ploughed in the second; sowed turnips, which were very poor; the succeeding crops, rye and corn, were excellent. I plant Indian corn for green fodder, after harvest, in June and July, on wheat and rye stubbles, and after a second crop of clover ploughed in. After the wheat and rye, the corn comes up dark, healthy, and vigorous; after the clover, yellow, sickly and unthrifty, but recovers. The succeeding crops after the clover are superior. In both instances the corn grows from 7 to 10 feet high. The ears form well, but do not ripen, making most excellent [stock] food. The pigs steal the ears, whilst the steers and cows eat the blades, (leaves.) Wheat, barley, &c. absorb what is in their roots in ripening; clover, turnips, &c. being not permitted to ripen, do not. Indian corn, horse-beans, &c. cut partially ripe, are intermediate between these two. If a field of rye or any other grain is harvested, and another ploughed in green, and both sowed with any other crop, that crop will grow for a considerable time much better after the former than the latter. I do not yet see the philosophy of this. Is the soil more exhausted whilst the rye is yet green, (always admitting that it returns more than it takes, after it decays when ploughed in,) than after it is ripe and all the roots gone? My observation would lead me to suppose that it is. All this puzzles me. When a crop of grain is ploughed in green, the land turns up almost like an old sod, and full of roots; so much so that we can scarcely cover the corn. Indian corn is universally grown in this country, and so ought horse-beans to be in England, in all soils that will grow them. The former matchless crop you cannot grow unless you can raise the temperature at midnight from 70° to 84°; I have known it 85°, and felt it. Meal and turnips are much superior for fattening cattle to either alone. This practice, with green crops ploughed in, as far as the climate will permit, would revolutionize the face of the whole of this country.

Is all this nonsense, and quackery, or is it a bomb-shell cast into the established system and opinions? My views, I think, show the very impoverished condition of the soil whilst clover is living, and its great fertility when decayed. Wheat fails after clover in Scotland and the north of England, and is by far the best after it in this country. Difference of temperature will account for this. For the "something is removed," read, "the clover roots being decayed makes the wheat successful." There is nothing removed but the poverty, which is unfavorable to wheat. These somethings, rootings, and tirings are poor guides and explanations. There is much to be learned and done yet in England as well as elsewhere, and it needs no ghost to tell it, in this most difficult and complex, most noble and godlike of all the arts and sciences. The future condition of hot climates is a darling dream of mine. All that has yet been done (with the exception of this country,) and how transcendant in some instances! was previous to the art of printing, or when it was of little value. The day is not far off (and close at hand, if free trade were established, so much talked of every where, and practiced no where, or likely to be so soon; northern countries had better keep trade as it is, as long as they can,) when hot climates will as far exceed cold ones, (the minerals alone of the United States would make a respectable island,) in productiveness and variety of food, comforts, luxuries, &c., and arts, sciences, and refinements, personal size, strength and beauty of man and beast, as latitude 52° now exceeds in all these latitudes 60°; and the face of nature will be as much more intensely green too. But all this is as heterodox, visionary, and absurd here now, and in "the fast anchor'd isle," as republicanism was 60 years ago every where. In less than another century, poor despised and neglected agriculture and its professors will be at the top of the ladder; "they who are first shall be last, and they who are last shall be first," if I read the glorious and cheering signs of the times rightly. We are thought little of here I assure you. What stronger proof of this is required than the fact that our farmers themselves think meanly of the first and most important of all professions? Please to put this on record from a man who has seen, thought, and read much, and who does not herd much with the world as it now is. When a man advances any thing new and startling, perhaps his readers have a right to know something of his pretensions. I give you some of mine. I was a pupil of the late excellent Mr. Runciman, of Woburn, and of that matchless man and farmer, Mr. Blomfield, of Norfolk. I resided a short time in the immediate neighborhood of the late Mr. Rennie of Phantassie. I was two years at Edinburgh College, and one season at the Royal Institution in London. I made an agricultural tour on foot over the greatest part of Scotland, and some parts of England; this was no education for fitting a young man of ardent mind and feelings for the yoke of tithes, game-laws, &c. But enough; I left relations, a few friends, home, country, and property, and I am content.

P. S. I see in your publications, American plants and bog-earth always coupled together. This country is not a bog, nor any thing like one. Rhododendrons, azaleas, &c. grow in this neighborhood on the dry steep declivities of gneiss and hornblende rocks; and thousands of rhododendrons grow in the state of New Jersey, upon sands as dry and barren as those of Brandon in Suffolk. I am not accustomed to writing, as you will perceive, and I fear my story is somewhat confused, but of the truth of its principles I am well convinced from experience. They will bear study and investigation.

Are air and water of any other use to vegetation than to ourselves? Plants absorb and decompose them; so do we: poor diet alone, notwithstanding. Does not vegetation derive all its food from what exists in the soil, and is not vegetable matter the beef and bread of vegetables? For this purpose weeds grow. My experience says something for this doctrine. Nature, farms and manures as well as man; but he has got it into his head to reject her assistance, and do things his own way.

GEORGE H. WALKER.

Longford, Holmesburg, near Philadelphia, lat. 40°
December 24, 1830.

[The writer of the foregoing article was a strong and original thinker, and, as his contributions to this journal have shown, excited interest in regard to every thing which he touched in writing, even when his meaning was very obscure, (as it often was,) or when his propositions were most opposed to the reader's opinions. But though the doctrine and practice here set forth were unquestionably original with Mr. Walker, (for he was one of the last men who would have assumed the merit that belonged to another,) it is nevertheless certain that the great and important and then novel system of manuring of land with its own vegetable growth, (or weeds,) is the main object, and most important item of value of the agricultural work of Col. John Taylor, of Virginia, which was first published nearly thirty years ago, and the rules of which the author had pursued still earlier in his regular cultivation. Clover, or weeds, to be left, or turned in, as manure, was one of the regular crops in Taylor's rotation. The misapplications of the rule, both in precept by the author, and in practice by himself and still more by his disciples, have been numerous and very injurious; and the instructions for practice of 'Arator' have been found totally worthless, for the purpose of making natural poor land very fertile, (or even to raise any kind above its natural degree of fertility,) by means of the land's manuring itself with its own vegetable products. But the want of effect is owing to the soil's being so constituted as to be incapable of retaining and profiting by the manure—and not because of the manure wanting value, or that Taylor had over-estimated its value, for soils needing the application, and capable of profiting by its value. Though we have elsewhere combatted the opinion of Taylor as to the general application of his doctrine, and have shown the injury to the progress of improvement caused by relying on the mis-application, (Essay on Calcareous Manures,) still none will go farther in applauding the principle of his doctrine, and in maintaining its *proper application* to be the very corner-stone on which to construct any plan of enriching land. And it has been acted upon, to more or less extent, wherever agriculture has been pursued with profit, though wastefully and without the operator's knowing, or generally having the least idea of, the manner in which nature was aiding and adding to his manuring processes.

The general theory or principle may be thus concisely stated: All vegetable matters, in proper state of decay and decomposition, serve as food for other growing vegetables, and of course for manure to soil needing it. Growing vegetables derive but part of their nutriment from the soil, and the remainder, (and a large portion,) from the air and from water, the elements of which become fixed in the plants, and serve as much to increase their substance, and their amount and value as manure for soil and food for future plants, as the other food which had been deposited by nature or by art in the soil. The power, too, to draw upon, and avail of this atmospheric manure is in proportion to the quantity and suitableness of manure in the soil. Therefore, whatever the natural soil, or manure applied, furnishes of food to a growing crop of plants, as much more, (or twice or thrice as much, it may be in certain cases,) does nature add thereto, by furnishing to and accumulating and fixing in the plants the elements of air and water. Thus, the crop which drew from the soil say 30 parts of its sustenance, derived thereby the power to draw 30, or perhaps 70 other parts from the inexhaustible sources of air and water; and the whole amount, if used to manure the soil, by being suffered to die and decay on it, will serve to again double or triple its amount and value for the next year's growth, by drawing a like addition from the atmosphere. In all vegetable and putrescent manures, more or less of this multiplying aid of nature is in useful operation, though it is not understood, nor suspected, by those who derive the benefit. And if it were not for this bountiful aid of nature, and the cultivated earth or plants received no more manure than man gives, or by possibility can afford, the most gentle and what is now the most improving system of cultivation, would be utterly and rapidly destructive of the fertility of the soil.

The farmer should continually bear in mind the general truth of this doctrine of Taylor's; and thence learn, and practise accordingly, that every load of manure, every addition of fertilizing power he gives to his field, bountiful nature multiplies in quantity and effect. But let him also beware of misapplying his efforts to soils not constituted to profit by them. The profuse supply of nutritious food, to a diseased stomach incapable of digesting and accumulating what is furnished, will not add to the flesh or the health of the subject; and the naturally poor land, the disease or constitutional defect of which is the want of calcareous matter, is as little fitted to retain, assimilate, and profit by, the supplies of vegetable matter which the unrestricted application of the doctrine of Taylor would direct to be given.—ED. F. R.]

For the Farmers' Register.

IMPROVEMENT OF LAND BY GRASS HUSBANDRY. HAY-MAKING.

Dr. Dwight has said, (if the document I quote from is correct) in speaking of the new land of the United States, "wherever the forest trees have been undisturbed by fire, they have accumulated, by shedding their foliage through a long succession of ages, and by their own decay, a covering of vegetable mould from six to twelve inches deep, and sometimes from eighteen to twenty-four. This mould is the best of all soils, and eminently friendly to every species of vegetation. It is indeed no other than a mere mass of manure, and that of the very best kind, converted into mould; and so long as it remains in considerable quantities all grounds produce plentifully."

"From this source it has arisen that all the unburnt new lands, in the northern, middle, southern and western states, have been, and still are uniformly valued beyond their real worth. When the tract on the Green Mountains in Massachusetts was first settled, the same luxuriant fertility was attributed to it which has since characterized Kentucky. About the same time it was ascribed to the Valley of Housatonac, in the county of Berkshire. From these tracts it was transferred to the lands in New Hampshire and Vermont, on the Connecticut, and thence to those in Vermont on the western side of the Green Mountains. From these regions the paradise has travelled to the western part of the state of New-York, to New Connecticut, to Upper Canada, to the countries on the Ohio, to the south-western territory, and is now making its progress over the Mississippi into the newly purchased regions of Louisiana. The accounts given of all these countries successively, were extensively true; but the conclusions which were deduced from them were in a great measure erroneous. So long as this mould remains, the produce will regularly be great, and that with very imperfect cultivation; for the mould in its native state, is so soft and light, as scarcely to need the aid of the plough. But this mould after a length of time will be dissipated. Where lands are continually ploughed, it is soon lost; on those which are covered with grass from the beginning, it is preserved through a considerable period. At length, however, every appearance of its efficacy, and even of its existence vanishes.

"The true object of inquiry, whenever the quality of a soil is to be estimated, is the nature of the earth immediately beneath the vegetable mould, for this in every case will ultimately be the soil. If this is capable of being rendered, by skilful cultivation, regularly productive, the soil is good; if not it is poor."

There is much truth in the foregoing extract, but I think there is also some error. Where lands are covered with grass from the beginning, unless they are constantly kept close mowed and grazed, the mould will not disappear; otherwise the prairies of the west which have been in grass, probably for ages, instead of being the richest of lands, would be now poor. Nor have they escaped the hoof and the tooth; for the vast herds of buffaloes which inhabited these countries prior to the settlement of the white man, derived their chief subsistence from them.

It is true, however, that the tracts of country described as having successively borne the character of eminent fertility, have one after the other lost it. And it is owing to their being "continually ploughed," whilst the whole crop has been taken off without any return, which is generally the case where a scarcity of animal labor exists, and the husbandman makes no effort to supply the deficiency through the resources of nature.

If productiveness is to be restored only by "skilful cultivation" on the European system of applying artificial manures, at great expense of human power, as I suppose Dr. Dwight means, I fear, for a long time to come, the occupants of these lands have rather a gloomy prospect, as labor is likely to continue dear with us through many generations. And the new Eldorados of the west, pursuing the same course, must meet the same result, until at last the whole of our vast republic will feel the evils of a barren soil. European agriculture, such as that of England and Flanders, is inapplicable here; and if our soil and climate did not afford us the means of obtaining fertility, without the expense of labor applied there to farming lands, our situation would be dreary. Fortunately the difficulties of scarce and dear labor are compensated by ample space, and our climate for the most part enables us to employ the means of covering the lands, which our space admits of being consigned to rest with a growth calculated to heal their wounds.

The grasses are the agents we must chiefly employ in this work, aided when practicable by minerals; not that they are the only ones, but such others as are now known consume more time than the short life of man can spare. Could American ingenuity be earnestly directed to this subject, I doubt not new sources of power would speedily be developed. We know such powers exist in nature to considerable extent, from the number now in use, and which might perhaps be enough if they were attainable every where. But lime and marl are too bulky to be transported great distances, and there are many situations where gypsum does not act, and others where it cannot be obtained. It would be extremely unphilosophical to conclude that we are acquainted with all the agents of this character, and the analogy of nature would rather lead us to infer there are many more, and perhaps some within the reach of all. There is a peculiar propriety in expecting these discoveries from American genius. Whilst it has a special bias to immediate utility, it has shown itself equal to any efforts. The disarming the lightning of the clouds, and the almost practical annihilation of the distances of earth, although the most splendid instances of its power, are only higher examples of an abundant stock of talent similar in kind, but not so conspicuous—perhaps not so fortunate. The Patent Office at Washington, affords many proofs to sustain this assertion.

There can be no question, I think, as ascertained by the experience of many, that the vegetable mould is restored to exhausted lands by putting them down in grass, and allowing them to remain long enough in that situation for the decomposition of the roots and tops of the grasses which have grown thereon. Even when grazing and mowing are practised in moderate degree, that result is not prevented, provided a moiety of the top is left in the one case, or the second crop in the other.

This is a consideration of great importance to a large portion of Virginia, already too much reduced in fertility to yield a profit to cultivating labor, and having no resources for restoration except those which the hand of nature yields. Fortunately the poorest lands are capable of producing some kind of useful grass, and there is none but has some fertilizing quality. They all too, yield with tolerable management, good hay, a resource of the utmost consequent to an impoverished farm, and which is far more neglected in that portion of the state that needs it most, than could have been anticipated from the intelligence of the people on other subjects. When hay is obtained in abundance, the corn may be spared the process of stripping the blades before the grain is perfected, which so materially diminishes its product. Fat meat, milk, and butter, follow in the train of good meadows; and every animal on the farm, more or less, participates in the advantages. Red clover, as a fertilizer, is the chief and is the best known; and fortunate is the land-holder whose soil produces it abundantly. But the process of making hay from it in an economical manner is not generally understood, and it may not be useless to mention a few leading facts that may serve to simplify the ordinary mode, as practised in too many situations, since hay-making is one of the most important preliminary steps to improvement. When the heads of the grass begin to turn brown, and about half the crop has assumed that hue, which occurs in this latitude and elevation between the 20th of May and the middle of June, it is generally thought to be in the best condition for cutting. The swarth should be permitted to lie as cut, to receive the influence of the sun, until towards the approach of night, when it should be raked together and thrown into small cocks from three to four feet in height. If the weather continues fair it may remain in this situation three or four days, then be opened and exposed to a day's sun, and collected in cocks again at night, three or four times the size of the first. Most commonly the next day, (or in any event by being spread open to another day's sun,) it will be fit to stack, which can be known by its feeling dry and elastic, like tobacco in good pressing, or (as it is called with us,) "*prising*" order. In this state the green color is preserved to a great extent, and the smell is as fragrant as that of the finer kinds of tea. In wet seasons the process is more difficult; but unless the rains are constant, opportunities most commonly occur, to open the grass long enough to have it dried by the sun, which should be done as soon as possible after the sunshine appears, when it may be either cocked again, or stacked, according to its condition. If it is suffered to remain wet long, it becomes hot, turns black, acquires an offensive smell, in short, runs through the process of putrefactive fermentation, which unfits it for the food of animals. But if this process can be checked and the grass got dry enough to put away in bulk, by taking such intervals of fair weather as the season affords, still a good hay may be obtained, although it has been wetted more than once; but by no means as good as if the weather had been uniformly fair. Some persons reccommend sprinkling salt on the hay when put up, should any dampness exist in it, in order to preserve it. I infinitely prefer putting it away dry, and in our climate that may almost always be done. The hay is best which is cured enough to house or stack with the least exposure to the sun or rain, and a little experience will teach the farmer to avoid the evil of over drying on the one hand, or not drying enough, and thereby incurring the risk of putrefaction on the other. Clover being a grass with coarse stalks, when stacked in the fields and exposed to the weather, it admits more water into the bulk than finer grasses, and consequently much more of the hay is damaged, and rendered unfit for use, than occurs in similar situations when other grasses are used. Where hay is most wanted too, there is generally the greatest deficiency of house-room to receive it; and even where the homestead furnishes that, it is laborious and inconvenient at the busy season of hay-making to haul all the hay in. A simple contrivance in a great degree remedies these inconveniences, and has been practised on the writer's farm for a number of years with entire success. It merely consists in putting a layer of rye or any other long straw, on the clover at every two or three feet as the grass rises in the process of stacking, taking care that the straw projects six or eight inches from the body of the stack, and when it is finished bending the projecting straw downwards, so as to make it resemble the eaves of a house. If the stack when finished is well capped with straw, these eaves will conduct off nearly all the water that falls on it, and the grass will keep almost as well as that which is sheltered by a house. The quantity usually put in a stack here is about as much as can be drawn by a team with hay-ladders, sixteen feet long, at five or six loads.

Timothy, (*phleum pratense,*) the next favorite in central Virginia, does not flourish well on the eastern side of the Blue Ridge as far south as this, when standing alone. It rarely yields more than two good crops before it surrenders the ground to other grasses. But when mixed with red clover it is both more vigorous and more lasting. The impenetrable shade furnished by the clover seems to protect it from the action of the sun, and preserves that moisture in the land so congenial to it. There may be other influences also, for the grasses prefer the neighborhood of each other, and are generally so found in state of nature. Clover ripens earlier than timothy, but if they are cut as soon as the latter blooms, a most excellent hay is obtained, the clover not losing much by over-ripeness, whilst its brittleness, and liability to loss in moving, is counteracted by the greater pliability and toughness of the timothy. I think a larger crop can be obtained from the mixed grasses than from either singly, and it is certainly easier to cure the clover in wet seasons when mixed with timothy, than when alone. The pasturage is much better also than from either singly; the autumnal growth of the timothy affording good grazing when the clover has dried; and, when the ground is not over-stocked, I have known the pasture to be good in the middle of winter.

Orchard-grass (*dactylis glomerata*) is not likely to answer well here. It grows freely only on the richest lands, and requires frequent and heavy manuring to keep it up; affording no adequate compensation for this trouble, as the hay from it is coarse, and by no means as acceptable to horses as clover or timothy. 'Tis true it yields earlier grazing in the spring than the other grasses, but is not much less injured by it than they are. A few lots for the latter use may be advisable, but it cannot be recommended for the fields.

There is much land with us that will not bear clover or timothy to any extent, and yields very little from culture of any kind of grain. The soil is generally pale yellow, or inclining to white, when wet, breaking up to a great depth, and when dry almost impenetrable by the plough. The prospects of the cultivators of such lands would be hopeless, if no succulent grass could be produced by them. And there is fortunately one, the herds-grass or fox-tail (*alopecurus pratensis*) that seems peculiarly adapted for their use. It grows tall enough to make hay where no other valuable grass would attain that height without manure, and when it cannot be cut for hay, yields pasture. As there is so much of the kind of land here attempted to be designated, sometimes in tracts of several thousand acres, sometimes in quantities varying from one hundred to twenty acres, and lying as if it were dove-tailed into the best farms of the country, it is important to know if a profitable use can be made of it by any convenient process. The wood that grows on it is generally short, scrubby, and crooked, mostly fit only for the fire, except when it consists of pine, which is by no means of superior quality. Crops of grain raised from it being meager and unprofitable, pasturage seems its most appropriate application. But there is one serious difficulty that attends that use. The running-brier, commonly called the dewberry, grows with so much rapidity, and in so much profusion, that the land in the course of a year or two of rest, is almost as completely covered with it as other fields are with grass. I know of but one remedy—that is to allow the farm-hogs to winter on the ground where it grows. They are exceedingly fond of the root, and in pursuit of it, extirpate the brier more effectually than any other enemy. It remains to be seen if the grass will bear to have its roots as much turned up without destruction, as may be necessary to remove this pest.

I am not aware that any chemical analysis has been made of this soil, but it is to be classed with those which Sir Humphrey Davy describes as "stiff clays approaching to pipe clays in their nature." And which he truly says in dry weather "cake and present only a small surface to the air; and the vegetation on them is generally burnt up almost as readily as on sands." It is important this land should not be confounded with the grey soils, that having a red substratum, but a surface not much unlike, and chiefly to be distinguished by the lofty and healthy timber of the one, compared with the scrubs of the other. The grey lands are the best we have, being as productive in moist seasons as any, and far more so in dry, as was evident through the intense heat and drought of the last summer, as on previous occasions of a similar character. They strongly reminded me of the following description of the philosophical chemist, previously quoted:

"The power of soils to absorb water from the air is much connected with fertility. When this power is great, the plant is supplied with moisture in dry seasons, and the effect of evaporation in the day is counteracted by the absorption of aqueous vapor from the atmosphere by the interior parts of the soil during the day; and by both the exterior and interior during the night." (Agricultural Chemistry, p. 128. Philadelphia, 1821.)

The green grass, (*poa viridis*,) of inestimable value on soils adapted to it, does not grow abundantly here; nor do we know the means of propagating it extensively by art. In lime-stone regions of any fertility it abounds, and on the second low grounds of the western rivers, affords fine hay, and pasture, unrivalled by any others. But in Eastern Virginia I have never seen it cover a large surface in any one place, or grow tall enough, except in very few instances, to make hay worth cutting. It is becoming more abundant, 'tis true, in our improved lands, thereby indicating a disposition to increase with increasing fertility, and may hereafter be an important ingredient of our pasture fields; but without the aid of water holding calcareous matter in solution, (as is the case in the valley,) I do not anticipate much benefit from it as a meadow-grass. I will close this communication by observing, that the mode of making hay from all the grasses mentioned, except clover, is exceedingly simple. The principles are the same; but the application in the latter cases far more easy. If care is taken to dry the grasses with as little loss of their color and juices by evaporation, as may be compatible with attaining a state of dryness, and elasticity under such pressure as can be given by the hand, good hay may be made: It is far more easy than to cure corn-blades; and a hand will save more forage in a good meadow in one day than he can do by pulling corn-blades through a week. THOMAS MASSIE.

Nelson County, March 1st, 1839.

From the Maine Farmer.

VALUE OF ROOT CROPS.

The importance of raising roots to be used as food for cattle, horses and swine, during our long winters, cannot be too often nor too strongly impressed upon the farmers of Maine, at least until more of them enter somewhat more largely into the business than they do at present.

Potatoes are planted by every one as a matter of course. Next to potatoes perhaps the ruta baga crop commands the most attention. The sugar beet is next in order, though of but recent introduction. Mangel wurtzels have not generally found so much favor with the farmers of Maine as they ought to; nor has the carrot—but the most neglected of all is the parsnip. We do not recollect of ever having seen a field of parsnips growing in Maine, and yet we verily believe that, all things considered, they are the most profitable of either as an article of food for stock and swine. We have heretofore tried some experiments on a limited scale with them, and, providence permitting, we shall go more extensively into it another season. They require a little more care when they first come up, and are smaller than ruta baga, but are not so difficult as the carrot. They seem to be more nourishing than any other root, and chemical analysis warrents this idea. They will keep in the ground during the winter, but must be dug before they vegetate much in the spring. They will not keep so well in the summer as the Ruta Baga. The farmers in the Island of Jersey near England, are said to make their main dependence upon this root, and their cattle and swine are thereby rendered very profitable. The only objection that we know of to the carrot is the trouble it gives in weeding when it first comes up. Its small leaves so much resemble some of the weeds, that if the ground is very foul, it requires careful management to avoid hoeing it up with them. We have seen the good effects of these upon a horse to which they were given during the winter season. They certainly are preferable to oats, or at any rate were for that horse. The animal was a very fleet one, and belonged to a neighboring physician, who had a great deal for him to do; and yet he kept in perfect condition with no other food than good hay, and from a peck to a bushel of carrots per day.

The mangel wurtzel will yield when put in a favorable situation as much per acre, perhaps, as any other root. John Hare Powell, once raised sixteen hundred and thirty-four bushels to the acre and 14 rods; and Messrs. H. & T. Little, of Newbury, raised thirty-three tons, ten hundred and fourteen pounds to the acre. But English writers have told us of sixty tons to the acre. We believe that it requires a richer soil than ruta baga, and more of a clayey loam. Hogs are very fond of them. We saw Mr. Haines of Hallowell feeding his swine with them last fall, raw, and the manner in which they took hold of them, and the good condition which they exhibited convinced us that they were very profitable and nutritious to them. See his communication in the last number of the Maine Farmer. The more we see and learn of the value of the several root-crops in Maine, the more convinced are we that it is the true policy of our farmers to cultivate them extensively; and we hope that many who never have yet paid particular attention to this business, will begin this year. Manure high and plant close, and we will insure you a good and a profitable crop.

From the Farmer and Gardener.

INEFFICACY OF OYSTER-SHELL-LIME.

January 25th, 1839.

Dear sir—Having expressed an opinion unfavorable to the oyster-shell-lime as a manure, which appeared to not coincide with yours, I will proceed to state my reasons for this (it may be) singular opinion.

In the year 1832, I burnt about 2000 bushels, from which I made a compost, one-half at least of which was composed of rich earth collected from fence rows, which had remained mellowing and enriching itself for at least twenty years. In the autumn of the same year, I applied the compost broadcast on my wheat ground, and ploughed it in with the wheat. The result was exceedingly favorable, which I then attributed to the effects of the lime. I have since been convinced, it was partly the rich earth before mentioned, (as a large proportion of the compost,) and of deep ploughing.

In the early part of the year 1834, I burnt about 4000 bushels, and spread it on a field of 24 acres, that had been ploughed in the preceding autumn. In the spring it was harrowed with a heavy three-horse harrow, and cultivated twice previous to putting it in corn. The corn was carefully cultivated, and in the month of August sown in timothy. There has been no benefit perceived from the application in either the crop of corn or timothy.

In May, 1837, I gave the oyster-shell-lime a more distinct trial. In part of the field I spread on a clover-lay 200 bushels barilla-ashes per acre; on the other part of the same field, and all the land equally good, was spread 100 bushels oyster-shell-lime per acre. The whole was ploughed in early in June, when the clover was in blossom. The field was ploughed three times previous to sowing the wheat. The result was, the wheat on the ground ashed, yielded an abundant crop, and that on the ground limed, scarcely paid the expense of cultivation. In several other parts of my farm, I have applied the oyster-shell-lime extensively, and have in no instance experienced any beneficial result.

One of our very intelligent Maryland farmers assured me he always doubted its efficacy, and had paid particular attention to its results for the last fifteen years, and in no case has he discovered any benefit from the application of the oyster-shell-lime.

In reply to your inquiries of the oats sown by me, and quantity produced per acre, I take much pleasure in informing you, that in the year 1837, I sowed 10½ acres in what is generally called the Poland oats, and the produce was 650½ bushels well cleaned merchantable oats, and a small quantity unmeasured, say 15 bushels light, that would answer all the purposes for feed to my stock—I am under the impression the yield would have been larger had not they fallen about the time they were maturing.

In 1838, I sowed 13 acres of the same oats, the produce 715 bushels. The mode of cultivation was, to plough the ground deep in the preceding autumn, and again in the spring, after it had been well harrowed; I am under the impression the above is the general mode of cultivation, but of that I am unable to form a correct opinion, having never sown oats on my farm until the year 1837.

A SUBSCRIBER.

IMPROVING LAND BY LIMING.

To the Editor of the Farmers' Register.

The communication in the inclosed number of the "Farmer and Gardener, [inserted above,] on the inefficacy of *shell-lime*, seems to require some notice. Such an article, emanating, as it seems, from a practical farmer, and referring to numerous experiments to prove the utter worthlessness of what has heretofore been regarded as "the basis of good husbandry," is well calculated to encourage the indolence and incredulity that have so long retarded the progress of agricultural improvement in our country. Having read, reflected, and observed a good deal on the subject, we beg leave respectfully to express our dissent from the views of the writer; and in the course of the following observations, theoretical and practical, shall appeal to science, authority, and experience, in support of an opposite conclusion.

The objections of the writer seem to be confined to *shell-lime*; and the first inquiry that suggests itself is, whether chemically considered, there be any difference between this and *stone-lime?* And if not, whether there be any virtue as a fertilizing agent in the one which the other does not possess?

Chemists inform us that pure or quick-lime is the *oxide of calcium*, and is obtained by exposing *carbonate of lime* to a heat, by which the *carbonic acid* is expelled, and the pure or quick-lime remains. The true calcareous element, carbonate of lime, is uniformly the same, in nature, properties and effects; and chemically considered, lime is the same, but in a less or greater degree of purity, whether obtained by burning common limestone, oyster-shells, or the pure carborate of lime, such as Iceland spar, or Carrara marble. Many lime-stones are exceedingly impure, some of them containing as much as 10 per cent. of magnesia and other impurities, either inert or hurtful to vegetation. Oyster-shells, on the contrary, consist almost entirely of corbonate of lime and animal matter; which animal matter is expelled by calcination, and if it were not, could not be injurious to vegetation. Upon principle, therefore, there can be no reason assigned why *shell-lime* should not be as beneficial in agriculture as that procured from the stone.

We do not know how we can better enforce our theoretical views on this subject than by citing the authority of professor Ducatel in the following extract from his geological report. After giving the analyses of 10 specimens of lime-stone, from Baltimore, Harford, and Frederick counties, Maryland, he proceeds:

"It will be perceived that three out of ten are magnesian lime-stones; all of them contain more silica or sand than has been found in oyster-shells, and one, said to be most extensively used in Harford county, contains as much as 11 per cent. of inert matter. It follows, therefore, that as oyster-shells are composed nearly of pure carbonate of lime, they will afford a lime containing scarcely an appreciable quantity of impurities. If well burnt, (which is the case when no efferverescence is observed on treating them with a weak acid,) lime obtained from them may be deemed, with a fractional difference, equal, weight for weight, to the best stone-lime; and as their chemical composition does not vary, there is nothing to be deducted from the value of the product in consequence of the impurities that exist, as exhibited by the foregoing table, in most lime-stones, and that must necessarily form a part of the residue when *these* are burnt.

"If the comparative value of the two products be estimated by measure, a greater difference is discovered; but there is at the same time a disproportionate difference in price. A bushel of the best alum-lime weighs from ninety to a hundred pounds; whereas, the same bulk of shell-lime, unground, weighs from sixty-five to seventy-five pounds, and perhaps when ground would weigh eighty pounds—a difference of from twenty to twenty-five per cent. But the former costs from thirty to thirty-five cents at Baltimore, the most convenient spot for its delivery on tide-water, where the latter can be had for ten cents; whilst farmers conveniently situated on the bay side, might themselves burn the shells at an expense not exceeding six cents a bushel. These remarks refer to the lime obtained from recent or fresh oyster-shells; but there is little or no difference between it and that procured by the burning of those contained in the Indian shell banks, provided proper care be taken to separate them from the black mould and dirt with which they are mixed.

"It has been supposed, that because alum-lime has been found to admit of a greater mixture of sand than shell-lime, in the making of mortar, it was to be inferred that it is correspondingly better, or, as it is termed, *stronger* for agricultural purposes. But this is an unwarrantable conclusion; for, as this circumstance seems to depend upon the peculiar aggregation among the particles of the lime, which prevents it from *setting* too rapidly, (or, in other words, attracting water and carbonic acid from the atmosphere sooner than the wants of the mason require,) it would appear, on the contrary, that if any inference is to be drawn from it, it is adverse to the conclusion; whilst, on the other hand, the fact that shell-lime *sets very quickly* is favorable to the opinion, entertained by some persons, of its superior efficacy in agriculture—it being generally understood that lime acts in the soil in the condition of carbonate of lime. Admitting, however, that the peculiar arrangement of the particles in stone-lime which renders it in general coarser than the lime obtained from shells, may better fit it as a mechanical amendment to certain soils, the difference is at most as one to three, according to the datum upon which its superiority is predicated; namely, that in the preparation of mortar, stone-lime will bear three times as much sand as shell-lime. But even in this respect the conclusion is not warranted, except perhaps in the case of a purely sandy soil, in which lime *alone* would, it is believed, prove of little service."

Shell and *stone*-lime may therefore be regarded as nearly equivalent substances, and may be applied in agriculture with equal, if with any benefit. If the majority of our farmers were what they ought to be, reading men, it would be deemed unnecessary at this late day, to enter into an argument to prove the beneficial effects of lime in agriculture. The works of Sir H. Davy, M. Puvis, and other standard authors, and the contributions of many practical correspondents already published in the Register, taken in connexion with the eminent success of its application in Pennsylvania, in many other parts of our own country, and over nearly the whole of Europe, are sufficient to satisfy any person whose prejudices are not unconquerable. But as these works are by no means generally read, it may not be amiss to cite in a few words one of the very highest authorities in practical agriculture, Robert Brown, of Markle, author of the article "Agriculture," in the Edinburgh Encyclopædia. He says: "In fact, the majority of soils cannot be cultivated with advantage till they are dressed with *lime;* and whether this beneficial effect, shall be considered as an alterative, or as a stimulant, or as a manure, it will be found to be the basis of good husbandry, and of more use than all other manures put together. Whenever lime has been properly applied, it has constantly been found as much superior to dung, as dung is to the scrapings of roads or the produce of a peat mire."

That errors have been frequently committed in the use of lime, in consequence of which, injury rather than benefit has resulted in many cases from its application, cannot be denied. What may have been the cause of the failure of the experiments of the writer in the 'Farmer and Gardener,' it is difficult at this distance to say; but doubtless, if all the circumstances were known the reason might be readily assigned. Perhaps the soil was already sufficiently calcareous; or was deficient in *insoluble* vegetable matter; or contained a quantity of *soluble* vegetable manure, which was destroyed by the action of the *quick-lime;* or the writer may have expected a greater and more immediate return from the lime, than could be reasonably anticipated. Let us examine his communication and see if one or the other of these reasons will not account for the failure of his experiments and his consequent disappointment.

His first experiment was with lime used in compost. The result was exceedingly favorable, although he is now unwilling to give the credit of the improvement to the lime. This experiment of the writer is the only one in which his practice seems to have conformed to the principles of science and the experience of the best practical farmers. This method of using lime is almost the exclusive practice of the best cultivated districts on the continent of Europe, and has been successfully practised within my own knowledge, by some of the best farmers in Virginia. On this subject M. Puvis uses the following language: "Lime in compost is never injurious to the soil.

It carries with it the surplus of alimentary manure, which the surplus of product demands for its sustenance. Light soils, sandy or gravelly, are not tired by a repetition of this compost. No country nor author charges lime used in this state with having been injurious to the soil. In short, this means, seems to us the most sure, the most useful, and the least expensive mode of applying lime as manure." This experiment, as might have been anticipated, was attended with success. The next experiment was the application of 4000 bushels of *quick-lime* on 24 acres of land that had been ploughed in the preceeding autumn. We have no information as to the previous condition of the land; whether calcareous or not, whether rich or poor, whether abounding or deficient in vegetable matter. It may be fairly inferred, however, that the land was poor, (for regarding lime as a manure it would be natural to apply it to the poorest land,) and that the scanty coat of inert vegetable matter that was ploughed down in the fall, had been in a great measure decomposed before the application of the lime in the spring. Now to say nothing of the excessive quantity applied, any one at all acquainted with the properties of *quick-lime*, might have predicted with certainty, that this application of it upon a naked soil, containing little or no insoluble vegetable matter, would be without effect, or positively injurious. The following extract from Davy's Agricultural Chemistry, a very high authority, is to the point. "The solution of the question, whether *quick-lime* ought to be applied to a soil, depends upon the quantity of *inert* vegetable matter that it contains. The solution of the question, whether marl, mild lime, or powdered lime-stone ought to be applied, depends upon the quantity of calcareous matter already in the soil. All soils which do not effervesce with acids are improved by mild lime, and *ultimately* by quick-lime, and sands more than clays."

The last and "most distinct experiment," was the application of 100 bushels of quick-lime per acre on a field of clover in the month of May, which was turned in early in June, when the clover was in blossom. This application, which the writer seems to consider perfectly conclusive of the question, signally failed; the wheat crop on the limed land having been barely sufficient to defray the expense of cultivation! Nor is this to be wondered at. So utter a disregard of the principles of science, and the lessons of experience, could not have been attended with any other result. On this subject we again quote the high authority of Sir H. Davy: "When a soil, deficient in calcareous matter, contains much *soluble* vegetable manure, the application of quick-lime should always be avoided, as it either tends to decompose the soluble matters, by uniting to their carbon and oxygen, so as to become mild lime, or it combines with the soluble matters, and forms compounds, having less attraction for water than the pure vegetable substance." In the experiment under consideration, quick-lime is applied to a crop of green clover, one of the most succulent and soluble plants in nature, and immediately turned in so as exclude the atmosphere. Now what is the necessary consequence? The quick-lime, which naturally tends to absorb carbonic acid and become mild, being excluded from the atmosphere, the usual source for supplying that acid, naturally combines with the carbon and oxygen, the main constituents of the clover, and which united, form carbonic acid, and becomes again the carbonate of lime, and by this process the rich soluble vegetable manure of the clover, on which the principal reliance for the crop of wheat ought to have been placed, is destroyed; and the inconsiderate experimenter, instead of this abundant supply of alimentary manure, has on his land one hundred bushels of carbonate of lime, which might have been obtained at much less expense in the shape of marl, efféte lime, ground-shells, or pounded lime-stone.

"Quick-lime, (says Sir H. Davy,) whether in powder or dissolved in water, is injurious to plants." The only immediate beneficial effect arises from its power of decomposing inert vegetable matter, and it is not until it re-absorbs carbonic acid and becomes mild that it seems to possess the peculiar virtues attributed to calcareous manures, in the 'Essay' on that subject, of correcting the acidity, improving the texture, and increasing the productive powers of the soil, by comcombining with and fixing putrescent manures. Whatever may be the cause, there can be no doubt of the fact that lime acts in a very limited degree on the first crop after it is applied. It is a prevailing opinion in Pennsylvania, that a winter must pass before its effects are fully developed. M. Puvis, who seems to have been thoroughly informed on this subject, thus expresses himself: "To secure the effect of lime on the first crop, it ought to be mixed with the soil some time before the sowing of the crop; however, if it is used in compost, it is sufficient that the compost may have been made a long time previously." And many of the experiments detailed by the author of the article in the Edinburgh Encyclopædia, already quoted, go to prove that the beneficial effects of lime are not experienced until the 2d or 3d year after its application, unless it is aided by a liberal dressing of manure. Lime should never be applied under the delusive belief that it is an alimentary manure. It should be considered not as the food, but the physic of the earth. Our poor acid soils may be compared to a dyspeptic patient, with a voracious appetite, but a disordered digestion. Neither too much food nor physic will be of service. But as a dose of magnesia administered to the dyspeptic will correct the acidity and restore the functions of the stomach and make "digestion wait on appetite," so a proper quantity of lime or other calcareous matter, administered to such soils, will correct their acidity, restore their digestive powers, and fit them for the assimilation of vegetable food, which the judicious farmer will not fail to supply in sufficient abundance.

In the course of the foregoing observations, we think it has been established that for agricultural purposes, there is no material difference between *shell and stone-lime;* that the value of lime in agriculture is sustained by science and authority; that its beneficial operation, when properly applied, has been fully vindicated by the first experiment of the writer under consideration; and the failure of his other experiments been satisfactorily explained, upon rational and scientific principles, without in the least degree impugning the value of this, to us on tide-water, inestimable improver of the soil.

We had designed to close this communication with some details of our own experience in the use of lime. But the length to which we have unconsciously extended it, admonishes us to be brief on this head. Suffice it to say, that we have used *shell-lime* to a considerable extent for a number of years, and have never had our reasonable expectations disappointed. It is true, we never expected it to act like magic and make poor land rich at once. But it has never failed, to increase the crops, to improve the appearance and texture of the soil, and to insure the permanent improvement of the land by the subsequent application of putrescent manures. We have, however, always applied it, either in compost, (which we prefer,) or on land that has not been grazed the year previous, and have generally followed it by the application of alimentary manures. We are now preparing to apply about 2000 bushels upon a poor high-land soil; and as a preliminary step, are covering the thinnest parts of the land with leaves and vegetable mould from the woods. This land has not been grazed for two years, and has a considerable cover of inert vegetable matter.

Mr. Robert Bailey, one of your subscribers, in this neighborhood, has used lime in compost very extensively for a number of years, and with the most signal success. Having so improved the farm on which he resides, as to increase his average crop of corn from one and a half, the former product, to six barrels per acre, and to cause it to produce fine crops of wheat and clover where none grew before. He is now applying it on a larger farm, on a much more extensive scale, and during the last summer had on hand, as we were informed, about 10,000 bushels of shells. We have urged him repeatedly to communicate the result of his experience to the Register; and have threatened if he does not do it very soon, to have his premises surveyed, and a report made by another hand, of the great improvements effected by his well-directed energy and zeal.

We trust that the importance of the subject, and the injurious tendency of the erroneous doctrines we have been combating, will be deemed a sufficient apology for this long, and we fear tedious communication.

WILLOUGHBY NEWTON.

Westmoreland co., Va., March 8th, 1839.

[The article which Mr. Newton has answered above, had not escaped our notice, and it would have been republished before, and commented on, if it had not been without the responsible signature of a real name.

We join in the request to Mr. Bailey to communicate his experience in improving his farm, for publication in the Farmers' Register. He and sundry others of the residents of the tide-water region can present facts in support of the value of shell-lime, as well as of marl and of calcareous manures in general, which would out-weigh the opposing testimony of the writer in the 'Farmer and Gardener,' even if its importance were increased an hundred fold.]

For the Farmers' Register.

ESSAY ON VEGETABLE PHYSIOLOGY.

[Continued from page 70.]

CHAP. V.

STEMS. THEIR EXTERNAL FORMS. THEIR INTERNAL STRUCTURE. EXOGENOUS STEMS. MEDULLARY RAYS. WOOD. METHODS OF DETERMINING THE AGE OF TREES. SEASONING TIMBER.

Of true stems, that of the white-oak (*quercus alba*) may be assumed as the type. The stem of the white-oak, or the trunk, as it is more commonly called, rises like a column from the earth; largest near the surface of the ground, then gradually contracting in size, until near the point at which the first branches are inserted, where it again enlarges; thus forming a column, the curvature of whose surface is inwards. That this form is the best which the trunk could have, to enable it to resist the action of storms and high winds, is easily demonstrable on strict mathematical principles. Of this same fact, a remarkable experimental proof is afforded in the celebrated Eddystone lighthouse. Before the building of the present structure, several unsuccessful attempts had been made to erect a permanent light-house on the Eddystone rock. A little more than eighty years ago, Smeaton undertook the work, and as he states in his 'History of the Eddystone light-house,' took the trunk of an oak as his model. Since the building was completed, it has been exposed to the most violent storms—storms which have dashed the ocean waves over the very top of the building—and yet it has withstood them all uninjured.

From the form which the stem presents in the oak, we meet with many departures. In palms and similar trees of tropical countries, it does not divide into branches, but has the form of a simple cylinder, bearing a tuft of enormous leaves at its top. In other plants it lies like a cord on the ground, as in the cucumber, (*cucumis sativus.*) In others it takes a twining direction, often enfolding the largest trees in its coils. "In the Royal Museum at Paris, there is a specimen of a palm, so surrounded by an enormous twiner, as to be perfectly enclosed in it, as in a vegetable sheath; nothing but its extremities being visible." In most plants, the stem is solid; but in grasses and umbelliferous plants, it is hollow. In the tortoise plant of the Cape of Good Hope, it is a rounded knob, the bark of which is rent by deep fissures, causing it to present to the eye an appearance resembling that of a tortoise. In stapelias and some other south African plants, the stem is gouty, distorted and succulent, bearing soft projections instead of leaves. In the cactuses, it is sometimes flat, and divided into a number of leaf-like limbs; at other times, globular, and marked with soft projecting ribs, at others, angular and erect, rising into the air, a naked green club.

Stems, which have too little strength to stand erect, and sustain their own weight, together with that of their leaves and fruit, generally support themselves by fastening to some neighboring body. This they do either by coiling spirally around their support, as the pole bean, (*phaseolus vulgaris,*) or by means of thread-like organs called tendrils, as the common passion-flower, (*passiflora incarnata,*) or by what are termed aerial roots, as the trumpet-creeper, (*bignonia radicans.*) It is a fact, worthy of remark, with respect to twining stems, that whilst stems of different species twine in different directions, the stems of the same species always twine in the same direction. The stem of the pole-bean always twines to the left; the same is true of the stem of the hop, (*humulus lupulus.*) It may be well to recollect this, as it is often necessary in gardening to start the young stem around its support. If either of the plants just mentioned, be started to the right, it will soon throw itself down; or, if confined in any way, so as to be forced to make a turn or two in that direction, it becomes puny and of little account. This is a wise provison of nature; as most twining plants send forth several stems to twine around the same support; if they did not all twine in the same direction, they must, of necessity, frequently cross each other. Whilst all were young, they would lie close to the body of the support; but as they increased in size, the inner ones, in consequence of their growth, would tend to force the outer ones further out; whilst the outer ones, for the same reason, would tend to bind the inner ones closer to the support. In this way they would either cut each other off, or at least, impair the freedom with which their sap could circulate.

The grape, passion-flower, &c., fasten themselves to their support by means of a class of organs, termed tendrils. These are slender thread-like organs, capable of coiling spirally, and thus fixing themselves to neighboring bodies. Tendrils sometimes proceed from the extremity of the leaf, and appear to be mere prolongations of the mid-rib, as in the sweet-pea, (*lathyrus odoratus,*) but more commonly from the stem itself, as in the gourd, (*cucurbita lagenaria.*) When these tendrils first appear, they are straight, and not coiled as we generally see them; but being possessed of a contractile power, the moment they touch any suitable support, their end hooks around it, and thus fastened, they go on coiling themselves until they are firmly fixed their places. If the tendrils of the gourd-vine be left to develope itself fully, without being suffered to touch any other support, it will be perfectly straight. If it be then brought in contract with a rod, or any suitable support, the moment its end touches the rod it will hook around it; if the rod be now moved towards the vine, the tendril will not unhook, as might be supposed, but will coil itself further around. In this way a straight tendril may be made to coil itself throughout almost the whole of its length, in the course of a few minutes.

Notwithstanding the great diversity of form, and external appearance, which stems present, their internal structure is remarkably uniform. Those of flowering plants, are all made up of tubes, woody-fibre and cellules, arranged in one or the other of the two following ways. First, the tubes and woody fibre are arranged in concentric bands, having the cellular tissue, in part, packed in between them, and in part forming lines cutting them at right angles, and radiating from the axis of the stem. Such stems increase by the regular addition of new layers on the outside of the old wood; and are thence termed exogenous stems, or growers outwardly, as the name imports. This is the structure of all of the trees, and most of the smaller plants of this country. Second, the tubes and woody fibre are disposed in bundles throughout the stem; the interstices being filled up with cellular tissue. The stems having this structure do not increase in diameter, after they are once fairly formed, but only in solidity. This they do by the addition of new bundles of tubes and woody fibre internally. Hence they have received the name of endogens, or growers inwardly. An example of a stem of this kind is furnished by the Indian corn (*zea mays*). Many of the large trees of tropical countries are constructed on this plan. These two classes of stems will have to be considered separately. As the former is by far the most common in this country, as well as the best understood, we will commence with that.

In a transverse section of an exogenous stem of one year's growth, the three following parts are easily distinguishable from each other. 1st, the pith, occupying the centre of the stem; 2d, a band of wood surrounding the pith; and 3d, the bark or external covering of the stem.

The pith, or medulla, as it is termed by botanists, is a cylindric column of spongy cellular tissue, commencing at the collar or neck of the plant, extending throughout the whole length of the stem, and terminating in the buds. Its size, as compared with that of the whole stem is variable. In the white-heart hickory (*carya tomentosa*) of one year's growth, the diameter of the pith, is about one-sixth of that of the stem; in the elder (*sambucus niger*) of the same age, it is two-thirds. Herbs and young shoots, in proportion to their bulk, have much more pith than trees; indeed this must necessarily be the case, as the column of pith when once formed, never increases in size. In newly formed parts, the pith is juicy, being filled with the ascending sap; in the same stem, when old, it is dry, colorless, and very light. At first, it is an unbroken column, and in most plants it continues to be so; in some instances, however, it is torn into separate pieces by the rapid elongation of the stem; as may be seen in the stem of the walnut (*juglans nigra,*) and still more distinctly in that of the poke-weed (*phytolacca decandra.*) Respecting the office of the pith, many singular opinions have been entertained. Amongst others, which it would be useless for me to mention at length, some of the earlier botanists imagined its office to be similar to that of the nervous system in animals. This opinion was based upon a fancied resemblance, in structure and position, to the spiral marrow of animals. If the pith does indeed possess the properties of a nervous system, some plants are much more highly favored in this particular, than even the higher orders of animals. So far as we know, the principal use of the pith, is to transmit nourishment to the buds during the earlier periods of their growth. When no longer filled with the juices of the plant, it is apparently useless. It seems to be a temporary provision, to enable the young plant in the first instance, and the young bud afterwards, to grow until their own systems of vessels are fully formed; after that is accomplished, it is thrown aside. Such temporary provisions are by no means uncommon in nature.

If we examine the band of wood, which surrounds the pith, we will notice that it is cut at right angles, by a number of their vertical plates, sent out in every direction, from the pith to the circumference of the stem. These are called medullary rays, and are considered a part of the pith. Like the pith they are composed of cellular tissue; their more solid appearance arising from the strong lateral pressure to which the cellules have been subjected, by being interposed between plates of wood; thus giving to those cellules the form of thin parallelograms. These rays are channels of communication between the bark and the internal portions of the stem. Through them, certain of the elaborated juices which descend in the bark are carried in and deposited in the wood.

The wood, which exists more or less abundantly, even in herbaceous stems, and which forms so large a portion of those of trees and shrubs, in the stem which we have selected for examination, consists of a single zone or layer, composed of tubes and woody fibre, disposed without any regular order, except that the latter is the most abundant on the outside, next the bark. The second year of a plant's growth, a new layer is formed outside of the first, and similar to it in every respect. The third year this process is repeated; and thus the stem increases in size, a new layer being formed annually, as long as the plant lives. The wood of an exogen of one year's growth, may be viewed as an elongated hollow cone, extending from the base to the summit of the stem, and enclosing the pith. This cone does not extend further, nor does it enlarge in any way; but is surrounded, the next year, by another cone, which, like the first, after being formed, undergoes no change in dimensions. Hence as the necessary result of this mode of growth, the stem of an exogen is more or less conical.

As each layer, or to speak more accurately, each hollow cone of wood, is the result of a single years growth; it is evident that the age of an exogen may be ascertained by counting the number, or rings presented on a transverse section of the stem, made near its base. This may be done with great accuracy, in most trees of temperate and cold climates, in which, in consequence of the periodical suspension of vegetation, the annual layers are distinctly marked; but in the case of trees of the torrid zone, where vegetation goes on thoughont the year, this cannot be so readily done. In old trees, the rate of increase being very uniform, their age may be determined with considerable accuracy, by the inspection of a mere fragment of the stem, the diameter of the whole stem from which it was taken being known. A rough estimate of the age of a tree, is sometimes made, by dividing the semi-diameter of its base by the average increase of the species to which it belongs, that average being determined by previous observation. In these several ways, the ages of numerous very old trees have been determined. It should be remarked, however, that the determinations, except where they are based upon an actual counting of the rings presented by a transverse section of the trunk, cannot be regarded as any thing more than approximations to true age. A tree growing in peculiarly fertile ground, will enlarge much more rapidly than most other trees of the same species; and of course, with a given diameter, will have a less number of zones than the average. In the case of a tree growing in peculiarly barren ground, just the opposite effect would ensue. An estimate of the age of the first, made by dividing its semi-diameter by the average thickness of the zones of that particular species, would give too great an age. An estimate of the age of the last, made by the same method, would give an age less than the true one.

Another, and far more important source of error in the case of many very large trees, is to be found in the fact, that several stems, starting from the same root, sometimes become so thoroughly united, as to present to the eye the appearance of a single stem. Such, according to the testimony of most travellers, is the fact with respect to the celebrated sweet chestnut of Mount Etna; measuring 180 feet in circumference, or about 60 feet in diameter. Whilst speaking of the union of different stems, I cannot forbear mentioning a curious instance of it, which I had pointed out to me some time since. It was in the case of two trees growing two or three feet from each other. At a height of 14 or 15 feet from the ground, one of them had sent out a branch, which had become thoroughly incorporated with the trunk of the other. After this had taken place, the second tree had gradually decayed, between the point where this limb was inserted and the ground, until near the root, it was entirely dead. Yet at the time I saw it, several of its upper limbs continued to thrive, deriving all their nourishment from the roots of the second tree, through this branch. This may perhaps be considered an instance of natural grafting.

There is almost always a marked difference in color and density, between old and recent wood. The outer and more recent portions of the stem, have been called, in allusion to their color, alburnum; and in allusion to their office, sap-wood; the inner and older portions are termed the heart-wood. After a few years, the color of a layer of wood is changed, its density is increased, and it takes thereafter little part in the transmission of the sap. During the winter, it is true, it generally contains sap, but then this sap is rather deposited in it, than circulating through it. The change in color and density, by which sap-wood is converted into heart-wood, is caused by the deposition of a solid matter, peculiar to each species, in the tissues of that part. This matter is in most cases soluble in nitric acid, and hence it is, that if a piece of heart-wood be immersed in that acid, the color is discharged, and the piece again assumes the appearance of sap-wood. Where the matter deposited is a resinous character, as in the pines, it adds very much to the durability, and consequently to the value of the heart-wood. On this account, as well as on account of its greater solidity and strength, the heart-wood is universally preferred to the sap-wood, for use in the arts. As the layers of wood, in the course of a few years after their formation, cease to take any active part in the circulation of the sap, and, in time, become to all intents and purposes dead matter, it would naturally follow that the central part of the stem would be first to decay. Where the matter deposited in those parts is not of such a character as to protect them from decay, this is frequently found to be the case. The resinous matter, deposited in the heart-wood of the pine, is of such a nature as effectually to resist the disorganizing agencies which operate upon it; and hence it is that pines, even those of the greatest age, are never found hollow. But such is not the fact with respect to the matter deposited in the heart-wood of the sycamore, (*plantanus occidentalis,*) and hence all the oldest trees of that kind, are little more than mere shells.

This last remark is not at all inconsistent with the one which immediately preceded it. Place sap-wood and sound heart-wood in the same circumstances, and the latter will far outlast the former. Such is the situation of the two when used as timber; but let the sap-wood retain its vitality, whilst the heart-wood is dead, (and such is their situation n the living tree,) and the former will far outlast the latter. The power of the vital principle to preserve organized matter from decay, is something which we cannot explain; but of which we see evidence every where around us. Let a leaf be severed from the parent-stem, and fall to the ground, whilst another just by its side, retains its connexion with that stem. The former, under the combined agency of heat and moisture, soon undergoes complete disorganization; a part of it rising into the atmosphere in the form of an invisible gas, whilst another part remains as earthy mould, to mark the spot where it fell. The latter, under the action of the same agencies, goes on unfolding itself, perfecting its structure, performing its vital functions, and "dreams not of decay," until the frosts of autumn bring it notice that its work is done. In the possession of vitality, living matter has a complete release, under the hand and seal of the creator himself, from the action of those agencies, which in ordinary circumstances would operate upon it. It is for the time being, absolved from all obedience to the chemical laws which govern common matter. This difference between living and dead matter is one which should be borne in mind in all our reasoning respecting organized matter, as well vegetable as animal; the neglect of it has been a fruitful source of error in times past.

Besides the peculiar secretions which are deposited in the heart-wood of most trees, there is always more or less crude sap present, and often other substances, which seem to hasten the decay of the wood. The removal of these is the object of the process called seasoning. There are three ways of seasoning timber in common use. The first is by exposing it the action of the sun and atmosphere. In this way the deleterious substances are removed by evaporation. As these substances, when present, must of course occupy some space in the wood, their removal diminishes its size. If they be removed more rapidly from one side of a plank, or stick of timber, than from the other, the contraction of the two sides must proceed at unequal rates. The effect of this is to curl or warp the piece. On this account, it is advisable to season planks by the action of the atmosphere alone, without exposing them to the direct action of the sun, as it is next to impossible to have the sun act equally on both sides. Our most experienced engineers and builders advise that, in seasoning timber, it should be loosely piled up, so that the atmosphere may have free access to it on every side, and that it be kept under cover thoughout the whole process. A second way of seasoning is to expose the timber to artificial heat in kilns. This process is in theory the same as the first. The only things to be attended to in adopting this method are, to place the timber in such a way that all the parts of the same piece shall be exposed to about the same temperature; and to so regulate that temperature as not to char the wood. A third way is to immerse the timber in water. By this method we wash the injurious substances out of the wood, instead of drying them out. The vessels of wood, will of course, by this process, become filled with water; but water evaporates so much more easily than the substances with which the vessels of the wood are naturally filled, that after the latter have been washed out, the former will evaporate in the course of a few days. From the manner in which water operates in seasoning timber, the reason why a running stream is preferable to stagnant water for this purpose, will be at once evident. Fresh water is also better than salt, because although the latter will wash the wood as clean as the former, yet when it is itself removed by evaporation, its water only evaporates, whilst the salt which it contained is left behind. Salt being a diliquescent substance, attracts moisture from the atmosphere, and in this way the wood is kept continually more or less wet, to its great detriment as timber.

CHAP. VI.

BARK OF EXOGENS. LIBER. CORTICAL INTEGUMENT. ENDOGENS. AGE AND SIZE OF TREES. ACROGENS.

The third and uttermost portion of the stem is the bark. This consists of two distinct portions; an inner fibrous portion, termed the liber, and an outer cellular portion, termed the corticle integument. The liber of some plants is remarkable for its susceptibility of being split into very thin layers, which are tough enough to be employed in the manufacture of twine and cordage. It is from the liber of a species of lime tree, (*tilia*,) that Russian matting is made. In the Sandwich Islands, a species of cloth is manufactured from the liber of a tree common in those islands. In ancient times, the liber of some trees was stripped into layers, flattened, cemented into leaves, and used as a material to write upon, instead of paper or parchment. At the present day, a very good species of paper is made from the same material as the Sandwich Island cloth, and is used in those islands, both for writing and printing upon. The liber of very many of our common trees can be made into paper. Some years since, a German paper-maker, presented to one of the scientific associations of Europe, a treatise on his art, written upon upwards of thirty different kinds of paper, made from the liber of as many different kinds of trees, all of which were indigenous of Germany. The woody fibre of the hemp (*cannabis sativa*,) and flax, (*linum asitatissimum*,) so extensively used in the arts, belongs to the liber, and not to the woody portion of the stems of those plants.

The bark increases in thickness, by the deposition of a new layer every year, between the original bark and the wood; each new layer being formed in a manner precisely similar to the first, with this exception, that the cellular or spongy part, being excluded from the air and light, does not become green, as in the first instance. That a new layer is added to the bark internally, each year, Du Hamel has proved by a very simple experiment. He passed a metallic thread under the innermost layer of the liber of a young tree, and left it undisturbed for several years. On cutting across the bark afterwards, the thread was found to have been pushed outwards by the deposition, between itself and the wood, of new layers, corresponding in number to the years which had elapsed since its introduction. As the bark increases by the addition of a new layer annually, it would seem, that the age of a tree might be determined by counting these layers, as well as those of the wood. This can be done in the case of young trees, whose bark remains entire, but not in the case of an old tree; for as a tree increases in age, the outermost and oldest layers are torn by the continual distention of the growing stem, and becoming dead matter, finally fall away.

The duration of the bark varies in different trees. In the white-oak, (*quercus alba*,) and many other trees, it breaks into deep longitudinal fissures, as the stem increases in size. The separate portions into which it is thus divided often attain the thickness of half an inch or more. On the other hand, a great part of the bark of the sycamore (*platanus occidentalis*,) falls off every year, in the form of brittle plants. In the white-birch, (*betula populifolia*,) it separates into their membranous layers, which tear into separate pieces, and gradually curl up, until they curl off. The difference observable in the manner in which the bark of different trees is rent, arises from a difference in the manner in which the woody fibre is disposed in it. In some plants these fibres are disposed perfectly parallel to each other; in others, they cross each other at certain angles. In the celebrated lace-bark tree of Jamaica, they "are numerous, quite white, extremely fine, and when stretched out, open into a kind of delicate net-work resembling lace."

The bark is obviously intended for the protection of the young wood which is formed beneath it. It is also the medium through which the juices of a plant, after their elaboration in the leaves, descend, and are transmitted to the wood. Hence, the bark is absolutely essential to the life of exogenous plants; and there is no more effectual way of killing them than by removing a section of it all the way around the stem; or girdling them, as it is commonly called. In trees where the fibres lie parallel to each other, or nearly so, the bark may be cut perpendicularly, not only without injuring the tree, but often with decided advantage; inasmuch as the vessels of the new wood, or alburnum, are in this way enabled to circulate the sap more freely. In herbs, and in the young branches of trees where the bark is green and succulent, it performs the same functions as the leaves, and supplies their place, whenever, as in the cactuses, true leaves are wanting.

Endogenous stems differ very much from exogenous ones in their structure. The characteristic differences, as I have already mentioned when defining these terms, are the arrangement of the tissues, and the manner of their growth. Besides this, endogens differ from exogens, in having neither pith, medullary rays, bark, or wood, properly so called, but consisting of a confused mass of woody bundles, imbeded in cellular tissue. In the stalk of the corn, (*zea mays*,) which affords a good specimen of a stem constructed on the endogenous plan, we find an external cortical integument, without liber, and bundles of woody matter, so arranged throughout the cellular tissue, as to be much more numerous and compact at the circumference, than towards the centre. In the stem of the garden-asparagus, (*asparagus officinalis*,) the woody bundles are distributed uniformly, throughout the stem, and so soft as scarcely to be recognized as woody matter. The same arrangement of the woody bundles exists in the green-brier, (*smilax rotudifolia*,) the only endogenous shrub common in Virginia. In the stems of grasses, which have been said to be "the least endogenous of all endogenous stems," the structure is so modified as not to be at once evident. The peculiarity of these stems is, that they are hollow, except at their nodes or joints, which are very compact discs, closing the stem entirely. They are, however, in every instance, at first solid, and become hollow in the course of their growth. In other respects, the stems of grasses present no variation from the typical structure of endogens.

The slender fibres which appear in endogenous stems, consist of ducts, spiral vessels, and woody fibre, and may be traced as unbroken threads from the base of the leaves throughout the whole length of the stem to the extremities of the roots. Stems of this structure increase in solidity by the annual addition of new woody bundles, within and among those already formed. From this peculiarity in the mode of their growth, they have received the name of endogens, or growers inwardly. In these stems, the older portions of wood are found next the circumference, whilst the newer and softer portions lie next the centre. This furnishes a good characteristic for distinguishing them from exogens, in which the newly formed and softer portions are necessarily next the circumference.

There is no provision made for the growth of the rind of endogens, like that for the bark of exogens; it is, however, capable of distention to a certain extent whilst green; but when it once hardens, the stem can increase in diameter no longer. The horizontal growth of endogenous plants is therefore limited, except in those rare instances in which the rind remains soft and capable of indefinite distention. Endogenous stems having grown in a horizontal direction for a certain time with great rapidity, do not afterwards increase in diameter at all. The trunks of palms, and the stems of herbaceous endogens also, such as that of the asparagus, are almost as large when they first appear, as at any subsequent period of their growth. Ligatures, or the firm embrace of twining plants, by preventing further increase in diameter, soon destroy the life of exogens, whilst they do not affect the growth of endogens at all. The external structure of endogens furnishes no means by which their age can be ascertained. It has been said, that in palms, the external rings, indicating the situation of the leaves, coincide in number with the years which the individual has lived. Little dependence, however, can be placed upon this circumstance; for in many palms these rings have been noticed to disappear after a term of years; and besides, it is far from being certain that only a single ring results from each year's growth in these plants.

The life of endogens, as well as their increase in diameter, is limited by the nature of their rind. When the lateral growth of the stem has proceeded to a certain extent, the rind hardens, and the stem being in this way prevented from increasing in diameter, can only grow in length; and as the consequence, stems of this character are generally slender. The continual disposition of new bundles of woody matter, within the unyielding rind, finally produces a total solidification of the stem, and death follows as a necessary consequence. Thus the life of an endogenous stem is limited; for, unless destroyed by some external agency, it must die of old age. The individual, however, is seldom destroyed; for whilst the trunk is thus slowly perishing, the great accumulation of sap in the roots, causes the developement of new shoots from the base of the stem, and these continue the life of the individual when the original trunk dies down to the ground. In this view, the life of endogenous trees is unlimited.

In the structure of exogenous stems, on the other hand, there is nothing to limit either their increase or duration; they never die purely of old age, but when destroyed, are destroyed by some external agency. The central wood of exogens it is true, dies in the course of time, but the death of the stem does not follow as a consequence of this; for nothing is more common than to see a tree hollow, destroyed at its centre, whilst it is growing vigorously at its circumference. The sycamore (*plantanus occidentalis*) furnishes a remarkable and well known illustration of this. The oldest trunks are generally all destroyed, excepting a few of the outer and recently formed layers, which prolong the existence of the individual.

Some instances of grea size, and extreme longevity in exogenous trees, where the statement can be relied upon, may not be uninteresting. The *pinus lambartiana*, a species of pine indigenous to northern California, probably attains a greater size than any other known tree. One specimen, measured by Mr. Douglas, an English botanist, "was 215 feet in height, 57 feet 9 inches in circumference, at a distance of three feet from the ground, and 17 feet 5 inches, at 134 feet; thus giving as the solid contents of the trunk alone about 1200 cubic feet. This was probably, the largest single mass of timber ever measured by man."—"A sycamore growing near Marietta, Ohio, measures 15½ feet in diameter;" or supposing it cylyndrical, more than 45 feet in circumference. There is said to be "an oriental sycamore, growing near Constantinople, 150 feet in circumference, with an internal cavity of 80 feet." "The largest oak known in England, was called Damony's oak, in Dorsetshire, and was 68 feet in circumference. With respect to the age of trees, it may be remarked, that an elm has been to reach the age of 335 years, an ivy 450, an orange 630, an olive about 700, a cedar of Lebanon 800, a white-oak 1080, and a yew between 13 and 1400. De Candolle estimates the age of a Mexican cypress at 6000 years; but then his estimate was formed by dividing the semi-diameter of the trunk, by the average thickness of the layers of that species of tree, and for reasons before mentioned cannot be relied upon. If it were indeed so old, its young shoot, must have been watered by the waves of the deluge. The most aged, as well as the largest trees, in the northern parts of the United States, belong to the species *plantanus occidentalis* American plane-tree, as it is called in Europe, or butter-ball, as it is called in New England, or sycamore as it is more commonly called in the western and southern states. The largest and most aged trees, indigenous to the southern states, belong to the species *cupressus thyoides*, white cedar as it called in New England, or cypress as it is more commonly called at the south.

If we compare an exogenous with an endogenous stem, we are, at first sight, unable to discover any analogy between them; but on a more careful inspection, we will find that the principal difference in the arrangement of their materials consist in this: that in the former, the woody fibres and vessels, are disposed throughout the cellular portion of the stem, in the form of concentric zones, irregularly intersected by the medullary rays; whilst in the latter, they are arranged as bundles, irregularly placed throughout the stem. If we examine a transverse section of one of the bundles, with a good microscope, we will find it to be concavo-convex, with its convexity turned towards the outside of the stem. The convex or outer side, will be found uniformly more solid than the concave or inner side. Now if we suppose the medullary rays to be continuous throughout the length of the stem, they must cut the zones of an exogen up into bundles, very similar to those of an endogen. The medullary rays in an exogen, are but parts of the pith, consisting like that of cellular tissue only, and owing their peculiar flattened appearance, to the extreme pressure to which they are subjected by the growing wood. If in consequence of the wood's being more loosely arranged, this pressure was removed; their cellules would have the same form as those of the pith; indeed, the two would be undistinguishably blended together; and thus an exogen would assume very nearly the appearance of an endogen. We do not mean to make the impression, that these changes ever do take place; but only by supposing them, to point out more distinctly the resemblance which these two kinds of stems have to each other.

Besides these two kinds of stems, which are by far the most common, there is a third kind, met with only in ferns, and a few other closely allied genera of plants. In its general arrangement it resembles the endogenous method, but differs from it in this, that the woody bundles instead of presenting, on a transverse section, a circular or crescent shaped figure, appear "like a number of sinuous lines, doubling about among spongy matter." These bundles never increase in thickness, number or quantity, after being once formed, and of course this class of stems do not increase in diameter at all, but are able to lengthen only by the addition of new matter to their extremities. Hence, they have been termed acrogens. As this structure is very uncommon, and but little understood, in such an essay as the present it cannot claim more than this passing notice.

(*To be continued.*)

GREAT CROPS OF WHEAT IN NEW HAMPSHIRE.

Josiah Stevens, Esq., of New Hampshire, Secretary of State, raised last season on one acre of light soil upon his farm in Newport, very near thirty bushels of the common bearded wheat. He sowed upon this acre four bushels of dry slacked lime made at Wethersfield, Vt. Mr. Stevens is of opinion that his crop of wheat was doubled in consequence of the application of the lime. One bushel and a half of seed was sowed.—[*Mon. Vis.*

SALE OF DURHAM SHORT-HORN COWS.

The following are the names and prices of short-horn cows, recently imported from England, and sold near Philadelphia, in November.

Dairy Maid, calved in 1835, sold for	$540
Victoria, 1835 - - - - - -	520
Viviana, 1835 - - - - - -	530
Thornville, 1836 - - - - - -	500
Lobelia, 1836 - - - - - -	400
Enchantress, 1836 - - - - -	500
Minerva, 1836 - - - - - -	360
Sarah, 1836 - - - - - -	380

Two were brought to Virginia, and therefore, their pedigrees also will be given.

Hunnia, roan, calved June, 1835, by Bywell, dam by a son of Wellington, 688, g. d. a very good cow. The breeder was very particular in the selection of his bulls; though he paid no regard to pedigree, he nevertheless took as much pains as any breeder of the present day. Bywell, by Marlish, dam by the Warless Duke of Wellington, 231, g. d. by Sir Harry, 1444. Should calve to a bull bred by Sir Charles Lorain—sold for $500 to Corbin Warwick, Esq.

Lady Whitworth, dark roan, calved in 1836, by Mr. Hudspith's celebrated roan bull, and he was by Mr. Snowball's Wharmsley, dam by Mr. Coate's Exmouth, g. d. by Warless Duke of Wellington, 231. Lady Whitworth's dam, bred by Mr. Connel, of New Leith's Hall, by Cumberland. Exmouth, by Wellington, 688. Cumberland, by Phenomenon, 491, dam by Colonel, 152, g. d. by a son of Hubback. Should calve in February next to Edmund—sold for $530 to J. M. Warwick, Esq.

For the Farmers' Register.

IS THE PLANET WHICH WE INHABIT BECOMING COLDER?

An opinion prevails extensively, I find, among the philosophers of the present day, that this earthly habitation of ours is becoming constantly colder and colder, and that this has been the case ever since the creation. This opinion is founded upon a certain philosophical theory, which theory is founded on certain geological facts which the diligence of modern research has brought to light. I do not mean to say any thing of those facts, or of the theory founded on them. I mean only to inquire what evidence we have from history that the earth is becoming colder and colder. And even this inquiry I should not consider as very suitable for an agricultural publication, were it not that some efforts have been made to diffuse the opinion, I have mentioned, among agriculturists. They are told that the earth is becoming colder and colder; that this results from an invariable law of nature; that this process has been going on from the creation to the present hour, and must continue to go on until the earth becomes too cold for animal and vegetable life; that this cooling process has gone on so rapidly in the last half century that it is clearly perceivable by the old and middle aged inhabitants of our country now living; that the middle states are becoming too cold for the production of wheat; that the cultivation of that article must soon become the employment of the people of the southern states, and the cultivation of cotton must, about the same time, take up its residence within the tropics; and the end of the process must be that poor old Virginia will become a land of perpetual snow and ice.

These are gloomy prospects. Such anticipations are very discouraging, and have a tendency to paralyse the efforts of the farmer. I would say to him, on the contrary, cheer up! Be not discouraged. Whatever philosophers may tell you about the dissipation of the internal heat of the earth, or whatever you may believe on the subject, be not discouraged. There is a "more sure word of prophecy to which you would do well to attend." It is in the following words, viz: "While the earth remaineth, seed time and harvest, and cold and heat, and summer and, winter, and day and night shall not cease." (Gen. viii. 22.) That prophecy has been fulfilled to the latter, more than four thousand years, and it certainly requires no great stretch of faith to belive that it may be fulfilled during four thousand years to come. But let us proceed, at once, to consider the question we propose to discuss, viz: Is there any evidence in history which ought to induce us to belive that the earth was warmer in ancient than we find it to be in modern times? The most ancient, as well as the most authentic history which has come down to modern times, is contained in the scriptures of the Old Testament. These scriptures were written chiefly in Palestine; the prophecies of Daniel, perhaps, in Babylon, and the Book of Job in Arabia; but they all relate almost entirely to the countries of Palestine, Egypt, Arabia, Syria, and Mesopotamia. Within the last hundred years, numerous travellers from Europe have traversed all those countries, and of late years, a considerable number from the United States. Does it not appear evidently from their descriptions of the habits, the buildings, the productions, and the climate of those countries, that they now have the same temperature they had in the days of the patriarchs, 3500 or 4000 years ago? Did it ever occur to any one who had read the scriptures of the Old Testament and the accounts written by modern travellers of the countries just mentioned, that the climate of those countries is in modern times materially variant from what it was in ancient days? But let us descend a little to particulars. When the patriarch Jacob, who lived about 1700 years before the christian era, was overtaken by his father-in-law, Laban, among other severe things which he said to him, were the following: "This twenty years have I been with thee, ***** *****, in the day the drought consumed me, and the frost by night, *****, surely thou wouldst now have sent me away empty." Jacob had kept Laban's flocks in the plains of the Euphrates. Would any shepherd of modern times complain more bitterly of the frost of that country than Jacob did? The book of Job furnishes us with additional evidence on this subject. It is agreed, I believe, on all hands, that this book was written, or at least, that the events which it narrates took place, about 1500 years before the christian era, and it is also, I believe, universally agreed the land of Uz, where Job dwelt, lay in Arabia to the south or south-east of Palestine. Arabia is well known to be, at the present day, a very hot country, yet Job speaks of cold, frost and snow, as things well known there in his day. There is one passage a good deal remarkable. "By the breath of God frost is given, and the breadth of the waters is straitened." (Job 37. 10.) It appears from this, that in Job's time the freezing, in his part of Arabia, was sometimes so considerable that the edges of the streams were so frozen as to contract their channels. I much doubt whether there is cold much more intense than this, even at the present day. But in the chapter immediately followimg that from which the last quotation is taken, a degree of cold still more intense is spoken of. "Out of whose womb came the ice? and the hoary frost of Heaven, who hath gendered it? The waters are hid as with a *stone*, and the face of the deep is frozen." (Job 38. 29, 30.] Although the two verses last quoted are introduced as spoken by the Almighty himself, and may therefore, be supposed to refer to other countries than that of Arabia, yet the Almighty speaks to Job, as of things with which Job himself was acquainted. It is not necessary here to discuss the question whether the book of Job be a real history, or a fictitious poem, or extended poetical parable. It suits my purpose equally on either supposition. If we refer to the book of Psalms and to the prophets we shall find cold and snow frequently mentioned. When any thing is spoken of as exceedingly white, it is compared to snow; "as white as snow." Sometimes things are said to be as white as wool. But wool in a tropical climate ceases to be wool, and becomes hair. If we inquire into the mode of living of the ancient inhabitants of Palestine, we find that was the same thousands of years ago that it is now. They were in very early times chiefly a pastoral people; as population increased they became more agricultural. In their pastoral state they had herds of cattle, and flocks of sheep, and goats. Are these animals which indicate a climate much warmer than that of Palestine at the present day? But when the people of Palestine, or a portion of them, became agriculturists what grains did they cultivate? We find it was barley and wheat. Boaz, who seems to have farmed extensively, and lived about years before Christ, cultivated barley and wheat. Are those grains suited to a climate much warmer than Palestine is in our day? But if we refer to the Greek historians, as Herodotus, Xenophon, Thucydides, &c., do we find in them any thing which would lead us to believe that the temperature of the countries of which they treat was warmer in ancient times than it is at present? But if we come down to the history of Rome, what do we there find on this subject? From whence did Rome obtain her wheat? Was it not from Sicily, from Egypt, and from the countries now called the Barbary states? But if we come down to modern times what do we find to have been the progress of agriculture? We find the culture of wheat has been gradually extending in Europe, from south to north, not from north to south as certain philosophic theories would lead us to believe. When Marshall, the agricultural tourist, travelled through some of the northern countries, he found, if I remember right, very little wheat in the northern parts of Germany, in Denmark and Sweden. The culture of that grain has been, almost ever since, gradually extending farther and farther north. It is well known that, within the last half century, the cultivation of wheat has been rapidly extending northward in England and Scotland. If the temperature of our world has changed, I think, so far as history goes, we might be justifiable in asserting that the temperature of the world is becoming warmer. I remember to have seen a book between 45 and 50 years ago, written expressly to maintain this opinion. The author adduced a great many facts in support of his position, all of which I have forgotten except two. One of those facts was, that we have accounts in ancient history, of armies being stopped in their march by great falls of snow in countries where, in modern times, snow never falls in quantities sufficient to produce such an effect. The other fact was that, in ancient times, the rein-deer were inhabitants of the Black Forest in Germany; but the climate becoming too warm for them they retreated to the northern parts of Germany; but that country becoming too warm they retreated to Lapland, and spreading themselves around the northern end of Europe, found a country whose climate, as yet, is sufficiently cold for their comfort. How far those alledged facts can be supported by history I do not undertake to say; but I do say that I know of no historical facts which lead me to believe, or even suspect, that the temperature of our earth is colder now than it was as far back as history extends. For a few years past, we have had, in the United States, winters very unfavorable to the growth of wheat. But this did not arise so much from the coldness of the winters as from their peculiar character—little snow, and a succession of freezings and thawings. If we had had snow as in former times, our wheat would not have frozen out. SENEX.

From the Genesee Farmer.

IMPROVED BREEDS OF SWINE.

The production of pork is one of the most valuable and important staples of the farmers of the United States: and the swine of our country are scarcely second in value, as farm-stock, to the entire amount of its neat cattle. Besides converting the offal and coarser and less valuable of the farm products into a marketable commodity in the feeding of swine, the richest and most luxuriant grain of the country is usually devoted to their preparation for market; and throughout the whole interior, in the pork-crop of the farmer is combined the surplus of his root cultivation, and the net proceeds of his coarser grains: the gross result of all depending on the final proceeds of his pork account.

This is a very important matter for the farmer. The entire *modus operandi* of rural economy is more or less concerned in a subject so interesting in its results of profit or of loss; and is entitled, I fancy, to infinitely more consideration than is usually bestowed upon it.

With most of our farmers, even at the present day, particularly in the western country, among that numerous and wide-spread class whose principal dependence is on their pork crop for reward, a hog is simply a hog—the name comprising all of excellence in the animal necessary to produce the article of pork required. The *brute* in question, for it deserves no softer name, is indigenous to the country. It exists in the streets of our cities, in the highways of our ordinary farming districts, and in the forests of the west and south—and in every corn-field and potato ground too, of the regions which they inhabit at all, provided the fences enclosing them to be not remarkably close and of an extraordinary height. Their cheif excellencies are, the possession of a surpassingly active and vigorous lever power in the poll and snout, acting by an ingenious co-operation of the spinal and nasal muscles; a celerity of speed, equalled only by the fox, or the hound, in a chase; and an indomitable propensity to all evil, conclusively illustrative of their lineage from a conspicuous race of scripture date. And this is the material from which is produced, in more than three-fourths of the United States, and indeed in almost the entire continent of America, the vast supplies of pork which are annually sold, purchased and consumed in the land!

Important improvements, and wonderful changes, have been introduced in most of our breeds of domestic animals and farming stock; but less in our swine than in any other. Why this universal neglect in the improvement of an animal furnishing us with our richest meats, and adapted to consume, in the most profitable manner, not only to the farmer, but to the common house-keeper the offal of both the harvest and the kitchen, is, not easy of answer, unless it be that its remarkable propensities of shifting for itself in its semi-savage condition, render it more acceptable to those who consider that every thing pillaged from their neighbors, or from the public, is so much direct benefit to themselves. This perhaps, is an uncharitable solution of the problem; but I feelingly appeal to those who, having a due regard to neighborhood comfort, and to individual right, if any other reason will account for the legions of miserable, starved, and mischievious brutes running at large, disgracing the name of even a—hog, and infesting almost the entire land.

Nor are the characteristics above named, the only objections to the common swine of our country. They are huge and gross feeders; equally gluttonous in offensive animal offal, even to carrion, as in vegetable food and grains. Measured by well chosen and approved physiological rules, and none other will or can be admitted by true economy, utility, or common sense, the animal in question will be found utterly inadequate in comparison, to the main purposes of the farmer or house-keeper for profit. From fifty to one hundred per cent. more food, as the case may be, is required to make a given quantity of pork of inferior quality, both in taste, and marketable varieties, from the common hog, than is required in the improved breeds of our swine. This fact has been so often demonstrated, that it needs no further confirmation, as all those who are conversant with the subject will readily testify. My own experience for many years, is satisfactory on this point, and with all intelligent men, and practical farmers, no doubt exists upon the subject.

Within the last three or four years, the public attention has become much awakened to the necessity of a reform in this important branch of agriculture, and following the rapid spirit of improvement in our neat stock by the importation of many valuable breeds of short-horn cattle from abroad, and their dissemination throughout our country, the better and more approved breeds of swine have been eagerly sought after, and to a considerable extent introduced into many sections of the union. Among our truly intelligent and thriftly farmers, the spirit of acquisition in all *improved* breeds of animals was never so active, and I imagine that it only needs the dissemination of fact and information among them, to draw their attention yet more closely to it.

So important does the question of a thorough improvement in the swine of the United States appear, as connected with not only the quality of our pork, but as a means of the absolute saving of hundreds of thousands, if not millions, of dollars annually to our farmers, that, since I have commenced the subject, I feel disposed, even at the expense of prolixity, to speak of some of our most approved breeds of swine; yet I shall discourse of nothing but such as I know and have tried by actual demonstrations, and such as I can with entire confidence declare to be worthy of attention.

As first among the most desirable breeds, I name the improved Chinese. These animals *in their purity*, are exceedingly scarce in the country. They may exist in several parts of the United States, but I know of them now at only one farm in this region. I first purchased a pair of Caleb N. Bement, Esq. at Albany, in the fall of 1833, he having obtained them of Mr. Dunn of that city, who many years before, procured the breed from New Jersey. At the time I purchased these of Mr. Bement, he had many others of the kind, and I then thought, as the fact has since proved, that he placed altogether too low an estimate on their value as an *original stock* for the improvement of other breeds. That gentleman has for some years past, I believe, been entirely out of the breed, having turned his attention almost exclusively to the breeding of Berkshires.

The principal and most important characteristics of this breed are, their exceeding quietness of disposition and habit; round and perfect proportions; tolerable length of body; delicacy of bone and limb; smallness of head, legs and feet; lighter in the offal parts than any other breed whatsoever; and a propensity to take on fat to a greater extent with less food than probably any other animal in existence. They are in fact the *beau ideal* of hogs! In size they are only middling, weighing at nine months old from 180 to 200; and at fifteen to eighteen months, 250 to 400 pounds; depending much upon their previous keep and fattening. Of the original pair which I purchased, the sow still survives, a good breeder, weighing in fair condition about 200 pounds. The boar at the age of four years, was overgrown with fat, and useless, although kept only on grass in summer and with low food in winter. He died when five years old, and his usual weight was about 400 lbs. One of their decendants is now four years old past, and has arrived at the same condition, being useless for breeding purposes. Numbers of their progeny have been scattered far and wide over the country. I bred many of them on my own farm, but the calls were too incessant for me to part with them, and not being conveniently located for their distribution, I parted with nearly my entire stock a year or two since, to Mr. A. B. Allen, who has bred them extensively for sale on his farm on the Niagara River, two miles below Black Rock. I have fatted many of this breed, mostly mixed with English blood, and a few full blood, and I never made pork with equal economy, and of such perfect qualitity as from these. It is the breed slightly mixed with some other, that I would always select for the purposes of my own farm, and I feel warranted in saying, without fear of contradiction, that a cross of the China is the most valuable of any other in the country for economical pork-making.

With all their perfections they are objected to by some; and entire frankness in the matter demands that their objections should be noticed. The first of these is, their want of size. That has been already stated. It is not an objection in my view. If they had longer legs, which would spoil them, this objection would not be so apparent. Others object to their lack of hardihood and want of constitution. If an entire absence of hog-like ferocity, and the greatest amenity of disposition of which the animal is susceptible, together with the love of a warm and snug shelter in the inclement season, instead of a wild burrow in a fallen tree tob, or an ability to *burglar* itself into luxury at any sacrifice to its owner or his neighbor, be faults, then truly have the China pigs most grievous ones; for they love a shelter and a home in winter; and it is dangerous to life for their young to come into this breathing world in very cold weather—the first of April to the first of May being early enough for a litter of full bred China pigs to see the light. I know of no other vices with which they may be charged, unless it be *the lack of bristles*, and a total aversion to run, or to jump a fence, even two feet high, or to be rapidly driven. The sows are universally good and careful nurses, having from six to nine pigs, rarely ten at a birth; which, if decently fed, they raise with abundant ease. Indeed, I know of no *fault* with the *pure improved China hog:* and still I consider them with all their good qualities, in their purity, not exactly the animal for the pork-making farmer. Were I to direct him what to do to raise his breed of hogs to the greatest pitch of excellence, I would say—no matter what his breed may now be, if not of the approved varieties—in the northern states, where his stock is fed in pens, with ground or cooked food—"Cross your stock with China, and keep crossing it, no matter how high, until they fail in size or vigor, and then go to the Berkshire or something else; but still let the main ingredient of the animal be China blood." The continual tendency of hogs, as of most other animals is, without great care, to deteriorate; to grow coarse and wasty; and I know of no cross which so readily brings them back into snug and correct proportions as the China.

I have had various crosses of these upon other breeds of swine, and I have never known an instance where they were not improved by the China blood. The size of the crossed China is large; frequently double that of the pure blood, varying from three to four hundred pounds at eighteen months old, and *always* excellent. Even in the first cross upon the wild-woods hog, the produce is astonishingly altered, and the second makes an admirable animal, with great constitution and hardihood, accompanied by the quiet disposition and fattening propensities of the parent China. More need not be said in praise of the China hog. Since I first obtained them, by judicious selections, they have been continually improving in their appearance and good qualities; and I fearlessly challenge the country for finer specimens of Chinese swine than can be shown from my former stock, now at Mr. A.'s farm.

If I have placed the China pig *first* in estimation, it is because I think him better fitted than any other to *improve*, as a first cross, the condition of our country swine generally; but for some purposes and in the opinion of many of our farmers, particularly the large grazing and pork feeders of the west, the Berkshire hog possesses properties of far greater attraction. In the description of this animal, I shall claim for him no refinement of character, or particular placidity of temper; for, so far as I have been acquainted, he is as much of a hog as any other variety within my knowledge. These have been so often and so well described and figured in the agricultural papers by my friend **Bement**, of Albany, who has a large herd of them, that my account will be a short one. Their main properties are, larger size, weighing from three to five hundred pounds at eighteen months and two years old; and at a much earlier age I should not think they would so profitably fatten; great vigor, constitution, and muscular action; but withal, an apitude and quickness to fatten rarely equalled in most other large breeds; extraordinary length of body; breadth of carcass; light offal; large, well shaped ham; and in fine an excellent pork-hog. They are a darker spotted than the China, being in most cases nearly black, but without bristles, or with very slight ones. The sows are prolific breeders, having from eight to fifteen pigs at a birth. They have the usually ravenous disposition and character of the common hog, sometimes devouring not only their own young, but whatever other feeble and inoffensive small animals may come within their reach. They are good nurses, and a sucking Berkshire pig can rarely be excelled in beauty by any creature of the kind. They are strong, and coarse feeders; exceedingly hardy; good travellers (a desirable quality for the western country, where the farmer drives his fat hogs to market instead of butchering them at home;) are remarkably well calculated to follow fattening cattle through the corn-fields, and to thrive on roots and coarse grains. They have obtained extensive celebrity on account of their great size, and other good qualities, and are, beyond question, with those who desire *extraordinary large*, as well as fine animals, the best *pure blooded* swine in the country. They have an increasing popularity; are sold in many instances at enormous prices, and will probably be multiplied, as they ought to be, throughout the United States.

Yet good as are these animals, they can be much improved by a cross of the China. They are antipodes in character and disposition; but each possessing excellencies of a peculiar and desirable kind, and when mingled with a cross of the Berkshire boar and China sow, the produce is the most perfect that the swine family, numerous as it is, can boast. I have had them, and have seen them elsewhere extensively crossed, and always with entire success. To the China is added, size, vigor, hardihood, and length of carcass; and to the Berkshire, docility, quietude of habit and disposition, delicacy of bone, limb and muscle, and a remarkable propensity to fatten—in fine, the best hog in the world! I never have yet witnessed such beautiful specimens of the swine family, as those of the Berkshire and China cross. When once made it may be followed upon either side, according to the fancy of the breeder; but let the cross be made either way, it cannot be amiss. I would therefore say to the farmer, if you would have the finest of hogs and the best quality of pork, procure both the China and the Berkshire, and you can never be at fault in possessing a perfect breed.

There is still another variety of swine which exists in this neighborhood, and which I deem too valuable to omit a passing notice of, while discussing this important matter. The origin is partly owing to accident, and partly to my own love of innovating, as they were first produced upon my own farm, and have since been so successfully bred and substantiated as to claim the merit of a distinct variety. They originated from a cross with a most valuable large white English breed, and the improved China. They were bred several years on my own farm, where some of them now remain, but they are principally kept as breeding stock, together with the China and Berkshire varieties, by Mr. A. B. Allen. He has given them the appropriate name of the Tuscaroras; and by a careful and judicious system of selections and breeding, he has brought them to great perfection. They combine in all their particulars, except in delicay and firmness of bone, the good qualities of the China. They are longer bodied, nearly double their size, yet smaller considerably than the Berkshire, and will weigh 300 to 500 lbs. at eighteen months old. They fatten equally as well when six or nine months old as the China, are lighter colored, being usually light spotted, the white predominating. They have the tranquil pleasant habits of the Chinese, without the uneasy, predatory propensities of the Berkshires, and are in all particulars just what the farmer of our northern and middle states would desire for a good stock and pork-hog.

In fine, I do not know that I can better conclude this long story, than by saying, that in small and delicate breeds the China is the most perfect; in the large and grosser sorts, the Berkshire is decidedly preferable; but, for a *good, honest, quiet, every-day hog*, the Tuscarora is, after all, equal, if not superior to either. At any rate, if you possess nothing but the common breed, try one or all of these, and you cannot but be essentially benefited. A notice of other varieties must be left for a future paper. ULMUS.

REMARKS ON WINE-MAKING.

To the Editor of the Farmers' Register.

Vicksburg, Mi., Feb. 11, 1839.

I perceive, in your last number, a notice of a secret method of making wine from the grape in the short space of six days. The subject of wine-making has occupied a good deal of my attention for several years past, and the article you have copied struck me with a great deal of force; not merely from the magnitude of its importance, great as it is, but from having had my own thoughts turned to that particular object for some time past. There are two principal operations which wine must undergo in order to perfect itself: firstly, fermentation, which is not generally completed under a year; and secondly, the deposition of the tartaric acid which it holds in solution, and which requires, in most wines, several years to accomplish fully. Corn and rye are made to develope the alcoholic principle perfectly in three days; and I think there is no doubt but that the juice of the grape may, by the addition of yeast, be forced to perform the operation in the same time. But it was a doubtful question with me, whether so rapid a fermentation would not cause a greater loss of alcohol, as a consequence of the greater degree of heat which would be excited. This question, however, is settled by Mr. Da Costa, for most unquestionably, this is a part of his secret; as the fermentation must be perfected before the wine is perfect. To dispose of the tartaric acid, however, was with me the greatest difficulty. I know of no means to hasten the deposition; and the only mode left was to neutralize it with an alkali; but whether this could be done without injury to the wine, was another doubtful question, and a question which I conceive Mr. Da Costa has settled. Here then, I presume, lies the secret of making wine in six days.

If this be the process of making new wine, then the renovation of inferior wine is simple and easy. Such wine has lost its alcoholic principle, or the greatest portion of it. All that would be necessary would be to add, say half a pound of sugar to the gallon, give it a gentle heat, and with yeast renew the fermentation; then treat it as new wine.

None of the treatises which I have seen on the subject of wine-making, attempt to give an estimate of the amount of alcohol dissolved in, and carried off by, the carbonic acid gas; but the statements of various writers show that it is considerable; and it is evident that the quantity lost must be in proportion to the heat generated, and the heat will be in proportion to the rapidity of the fermentation.

My object in writing this, is neither to come into competition with Mr. Da Costa, nor to worm out his secret; but it is to call your attention, not to this point particularly, but to the subject of wine-making generally. You have heretofore satisfied your conscience by giving publicity to such communications as were sent to you, and the extraction of a few articles from other periodicals.* If you look through the world, you will find that wherever the vine is capable of being cultivated, wine is one of the great staples of every country except our own, and it is certainly worthy of very serious inquiry why this country should form an exception to so general a rule. It cannot be the difference in the value of labor, for that difference is more than made up in the relative value of land and the taxes. Chaptal gives the medium value of land in the district of Champaigne at about one thousand dollars an acre, (English measure) and the taxes upon the produce at twenty-three dollars, making upwards of fifty dollars for the two items of rent and taxes. The value of the crop, he states at twenty cents the gallon. I have had several laborers with me, from the vineyards of Germany and France, who concur in saying that if they get one good crop in five years they are satisfied. Great as are the complaints respecting the rot in this country, I doubt not that our crops will average as much as those of Europe. Much labor and time have been devoted by yourself and others to the subject of silk and beet-root-culture; but I am certain that a few hours of research and reflection will convince you of the greater importance of vine-culture in the amount of profitable employment it will give to the country.

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* We do not admit the justice of this charge. Our correspondent was not a subscriber to the first three volumes of this journal, or he would have seen that as much attention has been paid to the subject of vine-culture and wine-making as could have been expected under the existing circumstances.—ED. F. R.

Among the cultivators of the vine in South Carolina, can you not find a successor to Mr. Herbemont, of equal learning, equal urbanity, and equal veracity? A SUBSCRIBER.

A PROFITABLE MODE OF CULTIVATING CORN. BADEN CORN.

To the Editor of the Farmers' Register.

Wigwam, Amelia, March 8, 1839.

Permit me through the columns of your journal, to recommend a mode of cultivating corn, which has been successfully pursued by a friend of mine, for the last 20 years, and which seems to me to be founded on reason. The gentleman to whom I allude is, Major Jno. H. Stegar, of this county, who is as remarkable for the large crops of corn which he yearly makes, as for the little labor he bestows upon them. His method is, to break the land well with a two-horse plough early in the year, taking care, however, not to turn up the clay, since he has found by experience, that the clay of Amelia, when turned up, never becomes productive. A coulter follows immediately after the plough, in the same furrow, so that the substratum is deeply broken, and a reservoir secured for the retention of moisture. By this means, and laying off his land horizontally, though with a level surface, his corn-field is but little liable to wash. In preparing to plant, a rake drawn by two horses is passed over the land in the direction of the rows for planting, and when the surface is sufficiently smooth, the rows are opened with a suitable plough, and the planting follows immediately. His rows are 5½ feet apart on ordinary corn-land, and the corn dropped from 24 to 30 inches apart. The experience of the first year, however, satisfied me, that a less distance may, with advantage be given; say 5 feet by 2. The corn is covered by a common cultivator, adapted to the purpose by taking out the front tooth. He prefers this mode of covering to any other, as it is much the most speedy, fills up the entire furrow, and pulverizes the adjacent earth. He has found that, corn planted in this way comes up better than in any other, and very rarely needs re-planting. After planting, nothing more is done until the corn is large enough to be thinned. The earth is now thrown from the corn, a single furrow on each side being run with a one-horse turning plough, the bar next the corn. The corn is then thinned to one stalk in a hill, and may then be weeded if there be hand-labor to spare. This, however, may generally be postponed until the furrow turned away is thrown back; which is done by the same ploughs immediately after they get through the field in the first operation. By postponing the weeding to this period of the cultivation, much hoe-labor will be saved, as the furrows when properly turned, will lap and cover most of the grass about and between the stalks. The grass not covered by the plough is covered by the hoe-hands; and where the earth is piled up too high against the stalks it is pulled down and levelled. This is a very rapid operation, as it often happens that no use of the hoe will be needed for 50 or 100 successive hills. When the ploughs have got through the field they commence again and turn a second furrow to the corn on each side as before, and a third furrow turned in the same manner, and at a proper time, finishes the row, and the culture of the crop. Thus the entire culture of the crop after planting requires only eight furrows of the plough to a row, two *from* and six *to* the corn, and of hoe-labor next to nothing. The principle on which this mode is founded seems to to me consistent with reason. It is simply this: that no root of the corn should be cut, if possible, and a constant accession of soft earth thrown to the roots as they extend. I know that it has lately been discovered that corn has certain latent vertical roots which cause it to prosper, however often the horizontal fibres may be severed; but giving due deference to this new discovery, and to the distinguished agriculturist who has promulged it, it still seems to me that the maturity of the plant must be retarded and its strength diminished by the severance of the least root, when not absolutely necessary. We know that the tobacco planter works his crop late in the season, when he wishes to retard its ripening, and give it the benefit of the autumnal dews. I have also been informed that the great success of a certain gentleman in Mississippi in raising cotton, who makes nearly double as much as his neighbors, to the hand, is, in a great measure, to be attributed to the fact that he works his crop as little as possible. But whether the theory be right or wrong, the above is the mode of culture pursued by Major Stegar; and to show its advantages, I might only state, that he is uniformly successful in making corn, and that his neighbors, most of whom, ridiculed his plan at first, have now generally adopted it. I doubt not that it will be generally adopted when understood and appreciated, wherever land is abundant, and labor scarce and dear. It saves so much labor, and enables a small force to cultivate so much more land than would otherwise be possible. By nearly a similar method, the last year with five horses and ten hands, I had 170 acres cultivated in corn, and sincerely believe, that after the land is broke up, 50 acres to the horse may readily be cultivated, of our common high-land. The saving of hoe-labor is also a great advantage. Not more than 30 acres of my whole crop had a hoe in it, and yet the crop was as good as my neighbors', and scarcely any difference perceptible between the portions where the hoe was used and where it was not.

In conclusion, permit me to say a word as to the Baden corn, about whose merits there seems to be so great an opposition of opinion. I planted last year about two and a half bushels, mostly on flat land, five feet by sixteen inches. Two stalks were intended to be left in each hill. But owing to neglect in thinning, the average was nearly three. Until July I never saw finer corn than some of it on the richest land. It continued green and flourishing in the midst of the drought, until attacked by myriads of chinch-bugs, at the most critical period, that of shooting. The consequence was, that the crop was shortened fully one-third, if not one-half. I measured about four-fifths of an acre of the best, and found it to yield eight barrels. Several stalks had from four to eight ears. I shelled and measured the corn obtained from one stalk with six ears, and it turned out two pints. Now basing a calculation upon this, I think it can be proved that on suitable land, rich low-grounds, no corn in use among us can be more productive. On such land the proper distance would be five feet by eighteen inches, two stalks in a hill. Planted in this way, there would be on an acre 5808 hills, each with two stalks. Supposing the two stalks to yield six ears or two pints, which I think might certainly be calculated on, if the flat land were rich, the product to the acre would be 182 bushels, or 36⅖ barrels. At only three ears, or one pint, to the hill, the product would be 18⅕ barrels, a product which even a James River planter might be contented with. This corn has two other recommendations; it furnishes a greater quantity of fodder, and matures sooner than the common kinds. The first results from its very great height, and the second from the smallness of the ear and husk. Though I think it an invaluable species for rich flat-land, I cannot recommend it for high-land, on which it seems to lose its capacity of maturing more shoots than the common sorts, whilst at the same time, it suffers more from drought.

WM. H. HARRISON.

CURIOUS EXTRACTS FROM THE ANCIENT LAWS AND RECORDS OF VIRGINIA.

(Continued from page 717, vol. VI.)

The legislators of the colony had no idea of the free-trade doctrine, nor of the importance of leaving the people to direct their own industry, as the best means of increasing the general wealth. Whatever evil or inconvenience was found, whether in excess or deficiency of any product, straightway the legislative power went to work, by some compulsory direction or prohibition of industry, or use of capital, to remedy the evil. Of course their efforts were generally of no avail. It has been seen that the exportation of horses had been repeatedly forbidden, for the purpose of increasing the stock. In 1668, either in consequence of such encouragement, or (as we should infer,) in spite of it, the increase of horses had been so great, that the prohibition to export was repealed. But this was not deemed sufficient; for the next year (1669) the assembly passed a law forbidding the importation of horses, under penalty of their seizure and confiscation. This act commences as follows:

"Whereas the last assembly partly to restraine the numerous increase of horses now rather growing burthensome then any way advantagious to the country, partly to encourage trade, did permit that mares might be exported, this assembly takeing care that both the ends might be advanced as aforesaid, *have enacted, and by these presents do enact*, that noe horses or mares after the last of December next, shall be by any person or person imported or brought into this colony, from any other plantation or government whatsoever."—*Statues at Large Vol.* ii. p. 271.

Again this year, the making of silk was invited by a new act of encouragement, as follows:

"Whereas the advancement for the makeing of silke will undoubtedly tend greately, as to the present honour and reputation, soe to the future great benefitt and profitt of the country, *It is enacted* that the former encouragement of fifty pounds of tobacco for every pound of wound silke be allotted as formerly out of the publique."—p. 272.

The same year another act for destroying wolves was passed which required of the tributary Indians, in proportion to the number of hunters belonging to each tribe, or settlement, a certain number of wolves' heads. The following commencement of the act sets forth the evil to be remedied, and the apportionment of the duty required.

"Since it is most evident that the inhabitants of this country doe receive dayly damage by wolves, and noe fitt way or temper yet found for the destruction or diminishing of them, *It is enacted* that the Indian tributaries be enjoyned and assessed to bring in a certaine number annually, that is to say:

		Bowmen or hunters.	wolves heads.
Into Nanzemond county, the Nanzemonds being about		45	9
Surry.	Pochay-icks	30	6
	Weyenoakes	15	3
Charles City co.	Men-Heyricks	50	10
	Nottaways, 2 townes	90	18
	Appomattux	50	10
Henrico county.	Manachees	30	6
	Powhites	10	2
New Kent.	Pamunckies	50	10
	Chickahomonies	60	12
	Mattapanies	20	4
	Rapahanocks	30	6
	Totas Chees	40	8
Gloster.	Chiskoyakes	15	3
Rapahanock.	Portobaccoes	60	12
	Nanzcattico Mattehatique	50	10
Northumberland.	Wickacomico	70	14
Westmoreland.	Appomatux	10	2
		725	145

p. 274–5.

The fence law in 1670, was somewhat modified, in violation of its general principle and policy, and consequently, with just so much deviation towards the support of justice. However, the restraints imposed were upon the stock belonging generally to the rich—from which it would seem that there was a little leaven of *loco-focoism* at work in the colony, even in the time and under the rule of that thorough enemy of popular rights, Sir William Berkeley. The act is in these words:

"Whereas the act ffor ffences doth not suffitiently provide for remedy of those many damages done by unruly horses breaking into corne ffields, *It is by the authority of the grand assembly enacted*, that the owner of such horses shall be, and hereby is required and enjoyned to take some effectuall course for restrayning them from trespassing their neighbours, from the twentyeth of July till the last of October in every yeare, it being much fitter that rich men who have the benefitt of such horses should provide for their restraint, then the poore enjoyned to the impossibility of every high ffences; and if any horse or horses shall at any tyme breake into any corne feild, the ffence being ffowre foote and halfe high, then the owner of such horse or horses, upon proofe of the damage, shall pay for the ffirst trespasse single damages and for every trespasse after double dammages to the party greived; and because question hath been made about the suffitiency of ffences according to the former act, of enjoyning them to be close to the bottome, *It is hereby declared*, that being soe close that nothing mentioned in the former act can creep through is only by that act intended."—p. 279

The last act for encouraging the killing of wolves by the Indians, being found ineffectual, was this year repealed, leaving the earlier act in force.

In 1671, millers were prohibited from taking more of the Indian corn, ground by them, than one-sixth for toll, and of the "English graine," as wheat was called, more than one-eighth part.

The long continued and favorite policy of prohibiting the exportation of wool, hides, and iron, was, by the following repealing act, abandoned at this session, on the avowed ground of the failure of the benefit expected.

"Whereas it was hoped that weavers, tanners, and smiths would have been encouraged with greater diligence and cheerfulness to have improved their severall callings for the good of the country when they were sencible what tender care was taken for supplying them with materialls for to work upon, in reference to which the exportation of wool, hides and iron, was by an act of assembly, (continued the three and twentyeth of March, 1661,) under greate penalties prohibited, and that act strengthened by diverse others since, but noe successe adswering the conceived hopes and apparent losses accrueing to all inhabitants by the refusall of those concerned to buy the comodityes aforesaid, *Be it therefore enacted by this grand assembly and the authority thereof*, that all acts tending to the restriction of selling or exporting of any of the comodities aforesaid stand repealed and every one permitted to make the best he can of his owne comodity."—p. 287.

In 1673, an act was passed to encourage the growth and manufacture of hemp and flax. It required that the county courts should cause to be distributed one quart of flax-seed, and one quart of hemp-seed to every tythable person; and each person, so furnished, was to make two pounds of dressed flax or hemp every year, under penalty of being fined 50 pounds of tobacco for each pound required and not produced.

The following enactment of the session of 1676-7, seems to indicate that there was much reformation needed among the clergy of the established and only church, as no other sect was tolerated.

"*And be it further enacted by this grand assembly, and by the authority thereof*, that such ministers as shall become notoriously scandalous by drunkingnesse, swearing, ffornication, or other haynous and crying sins, and shall be thereof lawfully convict, shall for every such their haynous crime and wickednesse, the ffirst time forfeite to the parish or parishes wherein he or they soe offending shalbe benificed, the one halfe of one yeares sallary and dues, and the same for a second tyme he shalbe convicted, and if any minister offitiating in any parish shalbe three tymes convicted of any such haynous crime and wickednesse before mentioned, that he be forever hereafter made uncapable of offitiating in any office or ministeriall ffunction in any parish in this colony."—p. 384-5.

The following section of the same act of general reform and regulation, (which followed soon after the re-establishment of the royal authority upon the suppression of Bacon's rebellion,) shows that the freedom of speech was treated with but scant respect in that time of excessive loyalty.

"And whereas it hath beene frequent for rude and ill disposed persons to contemne and revile authority and magistrates, as well in words as in actions; *Bee it therefore enacted by this present grand assembly, and by the authority thereof*, that all and every person and persons that shall from the tyme to come presume to speake and utter mutinous or contemptuous words, or shall by any wayes or meanes abuse the right honourable the governour, or any of the councell, justices of the peace, or commissionated militia officers, and shall be thereof lawfully convict, shall for his such offence, if against the right honourable the governour, be whipped on the bare back with thirty lashes, or pay eight hundred pounds of tobacco and caske, if against any of the honourable councell, that then he shalbe whipped on the bare back with twenty fowre lashes, or pay six hundred pounds of tobacco and caske, and if against any justice of the peace or commissionate feild officer, then to be whipped on the bare back with twenty lashes, or pay fowre hundred pounds of tobacco and caske, and the like for such second offence, being likewise thereof lawfully convict. And if any person or persons, male or female, shall be convicted a third tyme of such mutany or contemptious or villifying words, writeing or otherwise, abuseing or scanduliseing the right honorable the governour or any of the honourable councell or any justice of the peace or commissionated militia ffield officer, then to be whipped on the bare back with thirty nine lashes, and stand in the pillowry two howers, or pay double the before recited ffines, all which said ffines as aforesaid shalbe and belong the one halfe to the informer, if he shall sue for the same, and the other halfe to the county," &c.—p. 385-6.

At the same session (1676-7) an act was passed regulating the rates of charges of keepers of "ordinaries," or taverns, the prices being all stated in tobacco, the legal currency of the colony. The act required that—

> "Ordinary keepers selling liquors doe not demand or take more for Virginia drahmes, or strong beer or ale then is sett downe in the act of assembly made in September, 1671, that the rate of perry and syder if boyled be twenty pounds of tobacco per gallon, and if rawe eighteene pounds of tobacco per gallon, that the price of lodging be three pounds of tobacco per night, that the price of dyett where the generall court or assembly is held be twelve pounds of tobacco each meale, for the master, and eight pounds of tobacco for the servant, and in the country in all other ordinaryes, tenn pounds of tobacco each meale for the master, and six pounds of tobacco the servant. That the rate for horse pasture be six pounds of tobacco for one day and night, and if housed, for straw and hay eight pounds of tobacco the day and night, and for Indian corne after the rate of fforty pounds of tobacco the bushell, and for oates after the rate of sixty pounds of tobacco per bushell."—p. 393-4.

It is a curious fact that the importation of tobacco from the Carolinas, or in other words, the merchants of Virginia buying and exporting the products of the other colonies, was held to be so injurious to the interest of Virginia, that it was deemed necessary, in 1679, to pass the following prohibitory law. The same trade now continues from North Carolina; but the complaint is now from the other party, and with as little reason in the one case as the other.

> "Forasmuch as the importation of tobaccoes into this colony from Carolina and other parts, without the capes, hath been found very prejudiciall to this country and the inhabitants thereof, and for prevention of like mischiefe and inconveniency for the future, *Bee it enacted by the governour, councell and burgesses of this present grand assembly, and the authority thereof, and it is hereby enacted,* that from and after the tenth day of October next, after this present session, noe tobaccoes packt in casque or otherwayes, shalbe brought from without the capes of Virginia into this colony, either in boate, sloope, shipp, or other vessell whatsoever, to be landed on shoare, sold or shipt of in any ship or other vessell rideing in this colony, except only by such persons as shall make it appeare that they are inhabitants of Lower Norfolke county, and that the tobaccoes by them brought round the capes, is of the growth of the said county, upon penalty of forfeiting all such tobaccoes soe brought into this colony contrary to the true intent and meaning of this act, the one-halfe of such tobaccoes soe forfeited to be to the use of the kings majestie, and the other halfe to be equally divided betweene the informer and the country. *Provided alwayes* that it shall be lawfull for any merchant or other person inhabitting in this country to fetch from Carolina, commonly called the *South*, and bring hither all such tobaccoes as are already due to him before the makeing of this law."—p. 445

From the Magazine of Horticulture.

NOTICES OF CULINARY VEGETABLES, NEW OR RECENTLY INTRODUCED, WORTHY OF GENERAL CULTIVATION IN PRIVATE GARDENS, OR FOR THE MARKET.

In again presenting to our readers our remarks on new vegetables, we feel gratified in being able to state that our notices, which have appeared in our two last volumes, have been the means of introducing to greater notice and cultivation, many of the new productions which we have noticed and described. We shall continue to add all the information which can be gathered upon this subject, and shall not let any new variety, worthy of notice, escape our attention.

Among those kinds, which have been more particularly mentioned in our articles, and which have now become extensively known, and much cultivated, are Bailey's red and white giant celery, the forty-fold potato, the early Vanack cabbage, and the Soissons bean. Each of these varieties have been much sought after, and they have proved fully equal to what they were recommended. Many of the other sorts which were noticed are now under trial, and their good qualities will soon be ascertained. New vegetables do not find their way into cultivation with the rapidity of new fruits or flowers, especially among that portion of the community who would be the most benefitted by their growth; the prejudices of market gardeners and farmers against new articles, as well as new experiments, are almost fatal to their introduction. Unless the merit of a new variety is so very great as to partake of the marvellous, it is a long period before it becomes generally cultivated. The information, however, which is now diffused through the great number of farming periodicals is, luckily, dissipating such prejudices, and the more enlightened of our agriculturists have become somewhat convinced, that there may be great improvements made in the varieties usually cultivated, as well as superior kinds introduced, which may take the place of those we now value.

The past year, there has not been so many new varieties brought into notice, as heretofore. In the kitchen garden department there have been one or two introductions of some merit. To the farm there has been one addition of great importance in the Rohan potato; indeed we may, with truth, say, one of the most important acquisitions ever made to our husbandry. The past year was not propitious to the gardener or farmer in our vicinity; the unprecedented drought, during August and September, cut short the crop of most vegetables. Potatoes suffered severely, and the only crop which may be said to have been good and large, was the squash. Corn suffered in common with all other products.

In Britain, and on the Continent, some new vegetables have been introduced, which have attracted considerable attenion; these we shall briefly notice at this time, leaving a more extended account of them to a future period, when we may do so from our personal observation.

The *Cuba tomato,* introduced by Mr. Lowell, the seeds of which he procured in Cuba, during a residence there through the winter of 1837, was exhibited before the Massachusetts Horticultural Society, and noticed by us in our reports, (Vol. IV. p. 390.) Mr. Lowell stated in a note, that it was preferred by the Spaniards to any other variety. The fruit is rather smaller than the common tomato, of an oblong shape, and of a deep red color, not quite so bright as the former. It is fine for preserves. It is an abundant bearer, and full eight days earlier than the common kind. Mr. Lowell's recommendation is a sufficient guarantee of its goodness.

The imperial watermelon, a new variety, was raised the past summer, by T. Allen, Esq., of Hyde Park, New York, which, for richness of flavor, firmness of the flesh, thinness of the skin, productiveness, and every other good quality, surpasses any thing we have ever tasted. We do not know the source from whence the seed was procured; but it is sufficiently early to arrive at perfection in our climate, and it must become very extensively cultivated. The seed cannot, probably, be procured in any quantity, as only a few melons were raised; we shall, after the trial of another season, notice it again.

The Cedo Nulli pea, introduced for the first time last year, has promised to be a fine and very early variety, and one which we recommended to the notice of all gardeners. It is dwarf, early, and prolific. We would not have gardeners, as well as farmers, forget to cultivate, and extensively too, Groom's superb dwarf blue pea, which we have heretofore recommended.

The Rohan potato.—This remarkable variety of the potato will be very generally cultivated the coming season. The extraordinary produce in almost every single experiment which has been made in their growth, notwithstanding the past unprecedented dry season, has convinced even those who have little faith in new varieties of vegetables, that it is a most prolific, and, consequently, a valuable article. Only a very limited supply for planting could be obtained last spring, and four or five pounds was the most that could be easily procured by a single individual: but the increase has been so enormous, that, from this small amount of seed, a sufficiency has been raised to plant an acre or more.

After what we have said in our previous numbers, and the appearance of Mr. Kenrick's article, (p. 51,) it is not necessary that we should occupy the time of our readers with a repetition of the same, but simply remark, in addition, that there remains no doubt but that it is the most valuable article which has been introduced to our husbandry for many years.

We have given an account of the origin of this variety in our IV., p. 149. It was named in honor of the Prince Rohan, of Geneva, who was the first to disseminate it.

An opinion has gained ground, that the Rohan potato is very inferior to our common kinds: this, however, is a great error. We have previously given Judge Buel's opinion of its quality, and we can confirm what he has stated. When the potatoes are grown to their proper size, which is two or three pounds each, we have no doubt that, with the same care in cultivation, they will be found equal to any other variety. In proof of this, we may notice that a late London paper states. that a "new and extremely prolific variety, of German origin," was introduced last spring, and cultivated for the metropolitan market. Of its enormous produce there is no doubt; we lately stated, (p. 35,) that twelve hundred bushels might be raised on an acre; and we have no hesitation in saying that it may be made to exceed this!

A paragraph has just met our eye in the London *Gardener's Gazette*, stating that a new variety, called the mangel wurtzel potato, was introduced last spring, and that a gentleman of Waterford procured four of the tubers. These were cut into thirty-six sets, and planted on good land, with the usual quantity of farm-yard manure, in drills three feet apart and twelve inches between the sets, the whole occupying just twelve square yards. When dug, the produce was one hundred and twelve pounds, being at the rate of *thirty-five tons* to the acre, or thirteen hundred bushels. There is not the least doubt but that the mangel wurtzel potato, *so called*, is the Rohan, which has acquired the former name in England, from its great size. We again commend it to the notice of every farmer or gardener.

LARGE OAK TREES.

Loudon, in his *Arboretum Britannicum*, states that the oldest oak in England is supposed to be the Parliament oak (so called from the tradition of Edward I. holding a parliament under the branches,) in Clifstone Park, belonging to the Duke of Portland, this park being the most ancient in the island. It was a park before the Conquest, and seized as such by the conqueror. The tree is supposed to be fifteen hundred years old. The tallest oak in England was the property of the same nobleman—it was called *Duke's Walking Stick*—higher than Westminster Abby, and stood till of late years. The largest oak in England is the Calthorpe oak, Yorkshire, measuring seventy-eight feet in circumference where the trunk meets the ground. The *Three Shire Oak*, at Worksop, was so called from covering parts of Yorkshire, Nottingham and Derby: it had the greatest expanse of any recorded in this island, dropping over seven hundred and seventy-seven square yards. The most productive oak was that of Gelonds, in Monmouthshire, felled in 1810. Its bark brought £200, and its timber £670, (about $4,000.)—*Arb. Brit.*

From the Maine Farmer.

MORE ABOUT HOGS.

Any experiments which render the operations of the farmer more certain, or which shall give certain data whereby to calculate the profit or loss of any pursuit in agriculture, are of great value. One trouble in the business of the farm has been, the uncertainty with which the cost and the returns of investiments in this occupation has too generally been attended, owing to the remissness of farmers in keeping proper accounts. The keeping of hogs and the fattening of them, are subjects respecting which much has been said and much been written, but after all, the exact cost, or an exact account current, has but in a very few instances been fairly kept. Arthur Young, many years ago, published some experiments wherein the expenses were laid down, and the profits also minuted. Mr. Colman also published some experiments a few years ago, which we copied into the Maine Farmer. These were valuable. Until within a few years it has been generally believed that Indian corn was the only *legitimate* food for swine, and although they were fed with potatoes and the wash from the kitchen, yet Indian corn, after all, was the only sure substance wherewithal to produce pork.

Now we are willing to ackowledge the great excellence of this article in feeding and fattening hogs, and almost every other animal—man not excepted; but oftentimes the expense of it is so great as to render it very unprofitable as an article for swine diet.

The experiments and researches of Mr. Colman, if we mistake not, established it as a fact that it should not cost more than *four shillings* (67 cents) per bushel. in order to render it profitable for making pork when round hogs sold at 6¼ cents per pound.

In situations where flour mills abound, the article called pollards, a portion of the ground wheat not fine enough to pack in barrels as flour, is oftentimes used as a food for fattening hogs. According to Young, a Mr. Jebb, a miller of Ireland, instituted some experiments to ascertain its value for this purpose. According to him, a barrel which would weigh 84 lbs. paid in feeding and breeding hogs, 18½ cents per hundred weight—that is, when pork is worth $4,44 per cwt., he could make 18½ cts. per bushel, weighing 21 lbs. by feeding it out to hogs.

Mr. A. B. Allen, of Buffalo, N. Y., who is doing great good in his experiments in breeding and improving swine, and who has produced some excellent animals by his judicious crosses, informs us that he kept his full grown swine last winter, in the best of order almost exclusively on raw potatoes, at a cost, including time of attention, of only *three cents* per day per head; and he gives it as his opinion, that had he possessed an apparatus for steaming their food instead of giving it raw, he would have saved from 25 to 30 per cent on the above trifling cost. He also remarks, and we think with great propriety—that if this can be done in New York, Maine, with the best soil and climate in the world for the production of potatoes, can do it with much more advantage.

IRRIGATION OF LOMBARDY.

From Arthur Young's Notes on the Agriculture of Lombardy.

Lombardy is one of the richest plains in the world; for fertility of soil, united with the use that is made of it by watering, it much exceeds every other in Europe; but for mere natural fertility, I take the plain which extends from Holland to Orleans to consist of a richer soil, and it is also of a greater extent. From the foot of the Alps, near Suza, to the mouths of the Po, are about two hundred and fifty miles; and the breadth of this noble plain varies from fifty to one hundred, containing, probably, about fifteen thousand square miles. The Po bends its stately course through the whole extent, its branches ramifying, in innumerable streams, from the Alps on one side, and from the Appenines on the other; the prodigious extent of the former range, covered with eternal snows, afford a vast supply of water; preserved most conveniently in those immense reservoirs, the Lago Moggiore, Lugano, Como, Iseo, Guarda, whose waters are the origin of the greater part of the irrigations of Lombardy. But in the Appenines there are no such reservoirs, nor any extent of snow similar to that of the Alps. Thus the space watered to the north of the Po, is probably ten times more considerable than that to the south of the same river.

The soil of Lombardy is, wherever I viewed it, either sand, gravel, or loam. I met with none, or at least, with very little clay (speaking always as a farmer, and not as a naturalist,) and no chalk.

* * * * * *

If there be one circumstance which gives a superiority to Lombardy, over all the other countries I have seen, it is this, [its irrigation] and therefore it merits the most particular detail.

Piedmont—*Nice.*—Such is the consequence of water here, that a garden of 4 sestaradi, (a square of 12 trebucchi, *i. e.* 144 is a sestarada, and 400 trebucchi a giornata, which is to the English acre as 0.7440 is to 0,7929,) with a small house, lets at 20 louis d'or per annum, or about £15 an acre.

Coni.—For the last 10 miles from Nice to Coni, the country improves continually. The soil, near the mountains, is stony, but is a good sandy loam lower in the vale. It is perfectly level, and watered with the utmost attention, in a manner I had not noticed before; not, as in Spain, in beds, but the field is ploughed flat, sown with wheat, the clods broken with hoes and bush-harrowed, and then great deep trenches struck with the plough, for letting in the water; these are 8 to 12 yards asunder. They are now (September,) watering clover eight inches high, by letting the water into these trenches, and conducting it in a singular manner. A man walking backwards, draws, by a line, a bunch of straw and weeds, just large enough to stop the water in the trench, and force it to overflow on each side. This is an expensive and operose method, and inferior to the Spanish. The crops now on the ground are maiz; good, but not extraordinary: millet, and a little hemp; the male plants picked. A great deal of clover, but not much that is clean. But meadow abounds, which is the glory of Piedmont; and the conducting of the water, in multiplying conduits, seems well understood, and practised in great perfection.

Coni to Chentale.—In the watered meadows, much *chicorium intybus* and *plantago lanceolata.* Watered meadows are cut thrice commonly; but in some seasons, four times.

Racconis.—The watered meadows are now mowing for a third time; the predominant plants: the *chirorium intybus*, *plantago lanceolata*, *acchillea millefolium*, and *trifolium pratense.*

To Turin.—From Coni to Turin, something more than half the country appears to be watered; possibly two-thirds: and wherever the water is carried, it is apparently with great skill. It is, however, rather singular that more trenches are not cut for taking the water off the land; the attention is chiefly paid to bringing it on; from which we may conclude, either that the heat of the climate renders such drains less necessary than in England, or that water is too valuable, from every one understanding its use, to be brought on in the least superfluous quantity. The contrivance, towards Turin, for carrying the aqueducts of irrigation across the roads, are beautifully executed: for convenience of distribution, the water-course is raised three or four feet, or more, above the general level: these aqueducts are brought to the side of the road, and seemingly finish in a wall, but really sink in a syphon of masonry under the road, and rise on the other side, behind another similar wall. Seeing these buttresses of masonry, without perceiving, at first any water, I wondered for a moment, to what use they could be assigned; but when I mounted the foot-way, this beautiful contrivance was at once apparent. These are noble exertions.

Turin.—The irrigation in all this vicinity, is extensive, and carried to great perfection. Water is measured with as much accuracy as wine. An hour per week is sold, and the fee simple of the water is attended to, with the same solicitude as that of the land. Rich meadows, without water, sell for 1000 *liv.* and 1100 *liv.* a giornata; and arable, worth 500 *liv.* without water, is, in many instances, worth 2000 *liv.* with it. Such a meadow as will sell for 1100 *liv.* or 1200 *liv.* per giornata, will yield the first mowing, 115 rubbii of hay, worth 9*s.* to 10*s.* the rubbio; the second, 90 rubbii, at 7*s.* to 8*s.*; and the third, 80 rubbii, at 6*s.* to 7*s.*; the fourth growth is sold, to be eaten by sheep, at 5 *livres*. This produce amounts to 120 *livres*, or 6*l.* English, per giornata, which is under an acre. The interest of 1100 *livres*, being at 40 *liv.* or 50 *liv.* there remans a sufficient profit, after all expenses are paid. During the winter, as the meadows are commonly fed with sheep, they do not water at all. Some experienced cultivators avoid watering in the spring, till the frosts are over, which happen here as late as the 10th, and even the 15th of May, as strong fresh vegetation is, in such cases, entirely cut off; but, in general, no attention is paid to this circumstance; and watering goes on at all times, except when sheep are on the ground. Those who have water enough, let it on to their land once a week, during the whole summer; but if the weather is wet, once a fortnight; and a day or two before cutting, if the water is perfectly clear. In regard to the quality of water, they make no other distinction than that from mountains being cold; and that of the Dora, near Turin, being charged with so much sand as to be bad. They attend to the cutting of weeds in the canals, that they may rot; and some good managers harrow the bottoms in the spring, to foul the water, which then acts more powerfully as a manure. Another practice, which tends also to prove what excellent farmers they are in all that respects meadow-grounds, is that of paring and burning, which they perform on pieces that have a bad herbage, or want of improvement; but do not sow them with corn, or any other plant, except hay-seeds, in order to renew the grass, with no other interruption. It is impossible to praise such practices too much. They call this husbandry *motara.*

The power of effecting the great works in irrigation, which are visible over this whole country, depends very much on the law, which supposes the right and property of all rivers to be vested in the king; consequently all canals taken from them are bought of him; and this ensures another regulation, which is the power of carrying the water, when bought, at the pleasure of those who buy it, where they think fit; they cannot, however, cut across any man's ground, without paying him for the land and the damage; but the law does this by regulations known to every one, and no individual is allowed a negative upon a measure which is for the general good. The purchasers of water from the king, are usually considerable land owners, or communities that have lands wanting water; and it is of no consequence at what distance these lands may be from the river, whence the water is taken, as they have a right to conduct it where they choose, provided they do not cut through a garden or pleasure ground. Nor can they carry the water *under* that of others, whose canals are already made, as they might in that case deprive them of a part of their water; they are obliged to throw aqueducts *over* such canals. The benefit of water is so great and well understood, that nobody ever thinks of making objections; and in case their lands are not already watered, it is no small advantage to have a new canal brought through them, as they have the opportunity of buying water of the proprietors. It is sold per hour per week, and even half an hour, and down to a quarter. The common price of an hour per week, forever, is 1500 *liv.* At Gruliascho, four miles from Turin, there are many Persian wheels that lift up the water by buckets; the wheels are double, with washers between for the stream turning them; the buckets or boxes on one out side only; they raise the water 8 or 10 feet, and, about 2½ short of the full diameter of the wheel, and I could not perceive that they lose a drop; none falls, except what adheres to the wheel itself. To save the expense of multiplying sluices, for the occasional stoppage of water, in carrier trenches to force it over the land, they have a moveble board that fits the trench, which is placed occasionally where wanted, and answers the purpose well. They have none of the ramifications of carrier trenches common among us; and not so many drains for taking the water off, as with us; and, on the whole, do not shew any thing like our attention in the use of the water, though twenty, or rather an hundred times more in bringing it from rivers, and distributing it about the country; and I could not but observe, that their meadows have much bad herbage, and many places damaged by the water resting too long; this is more the case here than it seemed to be from Coni to Racconis, where the meadows carried a better countenance.

Turin to Chivasco.—Not one-third of this country is watered. At Chivasco but little also. After crossing the Dora Belta, there are soon two considerable canals of irrigation; one made two years ago only, which is as great a work as a navigation in England.

Cigliono.—Little land watered in this country; but I observed here some meadows, with off channels, from the principal ones, for conducting the water, which I did not notice before; but very few drains. The new canal crosses a gravelly waste, but none of it watered.

Trouchan.—A very rich country much watered; and many mulberries.

St. Germano.—Mowing the third crop of grass, and very poor; not more than 15 cwt. an acre, and yet watered. The glory of Piedmont is from Coni to Turin. Those who pass Mont Cenis to Turin, and Turin to Milan, see, on comparison, nothing.

Vercelli.—The new canal, now making, for taking water from the Dora Baltia, and conducting it to the rice grounds of Vercelli, is done by the king, and will cost three millions; the water is sold to communities. The other I crossed near the Dora, at the same time, was made long ago, and belongs to the Marquis de Bourg.

MILANESE.—*Buffalora.*—After crossing the Tesino, in several branches, and entering the Milanese, we find a great system of watering meadows to Buffalora, where that magnificent canal, the Navilio Grande is 20 yards broad, and though navigable, was originally made for irrigation alone.

St. Pietro Olmo.—Hence, for some distance, there is no watering; but then there is something in our Berkshire method; the lands are arched up, and just in the centre, on their crown, are the carrier trenches for conducting the water, and on each side a row of low sallows; some of these lands are two rods broad, and two feet higher in the ridge than in the furrow; the land firm and the herbage good: wherever the meadows seem good, there is abundance of *chicorium intybus, plantago lanceolata,* and *trifolium pratense.*

Milan.—As the irrigation of Milanese is perhaps the greatest exertion of the kind that ever was in the world, and certainly the first that was undertaken in Europe, after the decline of the Roman empire, it merits every attention that a farming traveller can give; for it will be found, by very briefly recurring to records, which have been searched, that great exertions (perhaps as great as ever known) were made in this country, at a period when all the north of Europe was in a state of barbarism. In the year 1037, mention is made of the canal Vecchiabbia. In 1067, watered meadows were common, called *prato roco* by Landolfo.* In 1077, there are notes of many streams used. In 1138, the monks of Chiarevalle bought of Giovanni Villano some commons, woods, and meadows for 81 *liv.* under the contract, (a parchment yet remaining,) "*ut monasterium possit ex Vectabia trahere lectum ubi ipsum monasterium voluerit et si fuerit opus liceat facere eidem monasterio fossata super terram ipsius Johannis ab una parte viæ et ab alia****&c. possit firmare et habere clusam in prato ipsius Johannis, &c.*" There is a similar contract of the following year, and various others, until the beginning of the 13th century; from which, and others, it appears, that the Vecchiabbia was the entire property of the monastery, and confirmed in 1276 by the diploma of the Emperor Frederick II. The merit of these monks appears to have been great, for they gained such a reputation for their skill and industry, that they had many applications for assistance in directing works similar to their own upon uncultivated lands; and the imperial Chancellor Rinaldo, in the time of the Emperor Frederick I. being appointed arch-bishop of Colone, found the possessions of his fee in such a deplorable state, that he applied for, and found the same assistance, as reported by Cesarior Eisterbacense. Their greatest exertions were in irrigation, which was so well known, that they sold their superfluous water, transferring the use and property of same by the hour, day, and week. In two centuries they came to be possessed of 60,000 *pertiche,* mostly watered: there is reason to believe that the practice, in the 18th century, did not materially differ from the present modes; because, in the papers of the archives of the abbey of that period, mention is made of *chiuse, incastri, bochilli, soratio,** and other works, to distribute the water, and regulate the irrigation.† In 1164, the Emperor Frederick gave various rights, in certain rivers, to the people of Pavia, for the purposes of irrigation.‡ In 1177, the people of Milan enlarged and continued the Navillio Grande, from Abbiate Grasso to Milan, being 14 miles; it was brought from the Tesino, near the Lago Maggiore, to Abbiate Grasso, 20 miles, by the people of Pavia, long before the date of any records now known to remain.§ In 1271, it was made navigable. It is thirty-two Italian miles long, and twenty-five bracchi wide, or forty-nine English feet.‖

The second great work, was the canal called Muzza, which takes the waters of the Adda, at Cassano, and carries them to Marignano, there dividing and watering much of the Lodizan. It was executed in 1220,¶ and done in so admirable a style, that Padre Frisi, in the preface to *Modo di regolare i fiumi, &c.* says,—"*il meccanismo d'irrigar le campagne é stato ridotto all'ultimo grado di maestria e di persezione nel canale di Muzza.*"** And Padre Antonio Lecchi, another great engineer and mathematician, remarks,—"*De' nostri trè celebri canali di Muzza, e de' due navigli qual altra memoria ci rimane ora, se non se quella del tempo della loro costruzione, e d'altre poche notizie, niente concernenti al maraviglioso artifizio della loro condotta*"††

In 1305, the canal of Treviglio was made, which takes the water from the Brembo, and carries it, for several miles, about twenty-five feet wide, and about three deep; it irrigates the territory of Triviglio and the Ghiara d'Adda. And, within four or five miles, there are five canals, taken from the Adda and Brembo, all of great antiquity. In 1460, the canal de Martesano was begun, under Duke Francis Sforza I.; it was twenty-four miles long, and eighteen braccia (thirty-five English feet,) wide; since lengthened seven or eight miles more. It takes the waters of the Adda, a little before Trezzo, by means of a powerful wear, (*chiuse*) founded upon the living rock; it is then supported for five miles by a solid wall of stone, forty braccia (eighty feet,) above the bottom of the Adda, and parallel with it. At Gorgonzola, it passes over the torrent Molgora, by a bridge of three stone arches. At Carsenzago, it is crossed by the river Lambro, which enters and quits the canal with all its floods. And, in order to prevent the surplus of water, which this circumstance occasions, from breaking the banks of the canal, or overflowing them, there are nineteen scaricatori in the canal, above, below, and facing the junction, which are so calculated, that they have not only powers sufficient to take off the waters of that river, but also half of those of the canal itself. These scaricatori are canals which take the water when sluice-gates are opened for that purpose, and convey it, at various distances, to the Lambro again; the fall in its course being considerable enough to free the canal from all superfluity of water. Near Milan, this Navillio receives the torrent Seveso; and, after surrounding the city, unites with the Navillio Grande and the Olona. The sluices which Bellidor supposed to be invented by the Dutch, were used, for the first time, near Padua, in 1481, by two engineers of Viterbo, Dionysius and Peter Domenico, brothers.* Leonardo da Vinci profited immediately of this great invention, for the union of the two canals of Milan; and finding between them the difference of the levels to be eighteen braccia, he, with six sluices, in they ear 1497, under Ludovico il Moro, opened and facilitated the navigation from one to the other. The greatest *scaricatori*† of the waters united at Milan, is the canal of Vecchiabbia, which, after having served some mills and irrigation, falls into the Lambro near Marignano; and if this canal were made straight, and supported by some fluices, the navigation might be continued to the Lambro, and thence to the Po and the sea. Both these canals, the Grande and the Martesano, are so contrived as to be completely emptied once a year, for cleaning and repairing whatever accidents may have happened to any of the works.

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* *Giulini,* tom. iv. p. 122, 224, 225.

* *Chiuse,* are sluices; *incastri,* are water gates, that are moved perpendicularly; *bochilli,* openings in the banks to distribute water; *soratoi,* discharges for carrying off superfluous water; the same as *scaricatori.*

† *Memorie Storica ed Economica full' Irrigazone de Prati. Don. Ang. Fumagalli Atti di Milano,* tom. ii. p. 215.

‡ *Giulini,* tom. vi. p. 330.

§ *Nuova Raccolta d'Autoriche trattano de tmoto dell' Acque.* Parma. 1768. 4to. Tom. vii. P. Prisi. p. 97.

‖ *Ibid,* p. 98.

¶ Verri, Storia di M. t. i. p. 240.

** Nuova Raccolta, tom. vii.

†† *Ib. Piano, &c. de tre torrenti,* p. 141.

I have entered into this digression upon a very curious subject, little known in English literature‡, in order to shew how well irrigation was understood, and how admirably it was practised, when the countries on this side of the Alps were barbarous. At the same time, however, that justice is thus done to these great exertions, we must bear in mind, that few districts in Europe are better, or so well situated for irrigation. The lakes of *Maggiore* and *Como*, nearly upon the same level, are three hundred feet (one hundred and fifty braccia) higher than Milan,—and that of Lugano two hundred feet higher than those, with a nearly regular declivity to the Po.

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(To be continued.)

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* *Moto dell'Acque*, vol. v. Parma, 1766, p. 359. Mentioned by Zendrini in the tenth chapter, *Sopra l'Acqua Corrente*. This is the common supposition in Lombardy, and is thus recorded; but it appears to be an error, by a passage in *Giulini*, tom. xii. p. 332, where, anno 1420, mention is expressly made of them, *machinarum quas conchas appellunt, &c.*

† The *scaricatori* are what I believe we call wears in England; they are discharges of superfluous waters. Mr. Brindley made them, in the Duke of Bridgewater's canal, circular, and in the centre of the river, to convey the water, as into a well; but in Italy they are cuts or openings in the banks of the canal, at places that allow a quick conveyance of the water; for instance, where a canal crosses the bed of a river: their powers are calculated with such a mathematical exactness, proportioned to the quantity of water brought into the canals, by the rivers joining them, that no floods ever effect the surface, which is of an equal height.

‡ One would naturally look for some knowledge of these facts in *Anderson's Deduction of Commerce*; but we shall look in vain.

BORROWERS OF THE FARMERS' REGISTER.

We have often been told, by subscribers to the Farmers' Register, of the great demand for their numbers, by some persons who found it cheaper thus to borrow, than to pay for the work, and who were willing thus to profit at the expense of those who do pay, and still more at the expense of the publisher. It has, indeed, often been reported to us from neighborhoods which perhaps had furnished but two or three subscribers, that their numbers were so popular, that the owners could not keep them at home, nor prevent their loss or destruction in the hands of borrowers; and sometimes in places where no new name had been added to our list for years together, this practice of habitual lending of the numbers by some one of the few subscribers has been mentioned as a friendly service rendered, to promote the circulation of the work, and as a plea of merit, in asking for duplicate numbers in place of the copies lost or spoiled by the borrowers. By such reports, we were even flattered, and gratified that our publication should thus be sought for and read, though by those who chose to avoid paying for it. But there is a limit to every thing; and the limit of our gratification, and tolerance of this wide-spread and growing practice has long since been exceeded.

Whether many, or even any, of these borrowing readers would become subscribers to and payers for the Farmers' Register, if they could no longer borrow, is more than we can tell; but even if no more gain is derived than is expected from such sources, still the cessation of the practice of lending will prevent the loss and destruction of thousands of numbers, which are caused by the borrowers from the owners, (*or takers without leave of the owners*, from the post-offices,) and which losses we have then to supply, and without remuneration. It is not unlikely that we have, in the course of this publication, furnished, and without charge, as many duplicate numbers as would, at subscription price, have cost $1000, to replace those lost or damaged by being borrowed. Yet sundry of these borrowers, within our knowledge, are very wealthy men, and who would be utterly amazed to be supposed guilty of an illiberal, much less an unjust or *mean* act, for the sake of saving the few dollars, the outlay of which would make the property their own, and pay what is due to the producer. By the published conditions, we have always engaged to furnish duplicates for copies not received by mail, under certain restrictions as to time and manner of notification, &c. This obligation has not only been readily and willingly discharged in every case, but we have never adhered to our limits, the proper and seasonable safeguards against too great carelessness of subscribers, and of too great loss to ourselves—but have supplied all duplicates asked for, no matter when and how lost, and have never charged for any, except in a very few cases, when the losses amounted to nearly a volume, or more; and when, moreover, they were admitted by the subscriber to have been caused by his own fault. There has been no refusal to supply to any subscriber duplicates of one, two, or even three lost numbers, and without any charge, and even when he had no claim under the rules, if they could be furnished without destroying an entire volume; and in many cases even that loss, of $5, has been suffered, by giving away a single duplicate number.

But this excessive and most onerous indulgence cannot be longer permitted to grow, or to exist; and the conditions for supplying duplicates of numbers hereafter lost, will be required to be complied with by all subscribers who may claim its benefit. The article stating these conditions was omitted in the last change of form, by accident, and not by design. It is now replaced, (Art. XI of Conditions,) and is as follows. We beg our subscribers to observe that *three things* are there required to make their claim valid—and that all these will be required, in regard to losses which may occur *after* this notice.

> "For all copies not received by mail at the proper post offices, duplicates will be furnished to those subscribers *who have complied with their own obligations;* provided that the failure *shall be notified through the postmaster,* and *within two months after the date of the miscarried copy.*"

The requisition of the evidence of the post-master (or his assistant) is not made because it is deemed better than that of the subscriber, but because none other *can* know the fact of the missing number not having been brought by mail. It is decidedly for the benefit of the subscriber that the statement of the post-master should be required, if the officer is (as is too often the case,) very neglectful of his official duties. For, if knowing that he will be expected to testify as to the non-arrival of lost numbers, he will be more careful to prevent their being borrowed, or taken away from his office.

We earnestly hope, that our subscribers and friends will see the propriety of these remarks, and will take no offence at our now requiring, what in fact, our conditions and justice and propriety required always.

To enforce the long established rule is all that we can do to restrain the depredations and heavy losses caused by the practice of borrowing. But we earnestly beg of all our subscribers who desire the prosperity of this publication, that, for the sake of promoting that end, as well as to check a most shameful abuse and injury of our right of property, they will hereafter refuse to lend the Farmers' Register, habitually, to any one who is able to pay for it. And to the borrowers, the poor as well as the rich, if we should still have access to them as heretofore, we will say, that at the very low price at which the Register can now be obtained, they can more cheaply pay for it and own it, than to pay the cost of the mere labor of borrowing and returning the numbers.

We also ask another favor of our subscribers, in aid of the object proposed; which is to forbid their numbers being taken out of the post-offices by any person without their special authority and order. If we can be guarded against the actual and direct losses caused by both classes of borrowers, (those *without,* as well as those *with* leave,) our guaranty of safe mail-transmission will add but a mere trifle to the general cost of publication.

The loss of copies, first to subscribers, and next to the publisher, by having to supply duplicates, is not the only manner in which the latter suffers. Sundry subscribers who are subjected to many of these losses by borrowers, or by a very negligent or a very accommodating post-master, cease to ask that their losses may be repaired; but to get rid of the vexation, discontinue their subscription. Thus, in various ways, we are made to suffer so much from this system, that we could more cheaply issue, for the benefit and use of the borrowers, and as a supply for the negligence of unfaithful post-masters, an extra impression of 300 volumes annually, provided, that by paying so much, all other losses and injuries, from these sources, could be avoided.

But, though requiring, henceforward, the conditions of re-supply to be complied with, we can, without adding to the great losses already sustained, and will with pleasure, and gratuitously, furnish duplicates of all except the deficient Nos. of Vols. 2 to 6 inclusive. Therefore, all old subscribers, who have lost any of the numbers which are surplus, may be supplied with any reasonable number, by writing for them, (post paid) within a few weeks after this notice.

The surplus numbers which can be thus given, are, at present, the following:

Vol. 2—All the Nos. except No. 3, and Index, which are deficient.
Vol. 3—All except Nos. 5 and 12, and Index.
Vol. 4—All except Nos. 1 and 2.
Vol. 5—All except No. 8.
Vol. 6—All except Nos. 4 and 8.

Any persons who may have to spare any of the numbers stated above to be deficient, will confer a favor by giving every such one. Our previous offers to *buy* such, at high prices, have been almost fruitless.

HUMBUGS. MULTICAULIS SEED AND CHINESE CORN.

It would seem that the information which we have aimed to furnish to our readers and the public is very little prized; nor is availed of even when it would prevent the most barefaced and shallow yet successful and gainful deceptions, which are continually imposed upon the agricultural public. It has been about five years since we first published the fact that the seeds of the multicaulis would not re-produce their kind, and that, of course, they were worthless for propagating the parent stock; and from time to time this warning has been often repeated, accompanied with the most positive proofs of its truth. Yet, notwithstanding, thousands of persons, and many even of our subscribers, have bought at enormous prices what has been sold for multicaulis or Chinese mulberry seed, and have failed, of course, to obtain a single genuine plant. Seed so named and recommended is still frequently advertised for sale; and at this time there is offered for sale 20 lbs. of it, by a salesman in Baltimore, every grain of which will probably be bought, (provided the price is *high enough,*) and be allowed to perpetrate a fraud, unless the planter should be so lucky as to find that it *will not vegetate.* It will add but little force to our charge, to say that not one pound or even ounce of seed truly produced from the morus multicalis has ever been offered for sale. All believe this who are well informed on the subject. But even if all the parcels of seeds so advertised were in truth so produced, they would be no better, and their progeny no more like the multicaulis than the seeds really sold, or those of any other kind of mulberry.

Another among the greatest of humbugs was the "Chinese tree-corn," advertised by Grant Thorburn, and puffed by so many papers who aided his "benevolent and charitable" design. We presented so full an exposure of this very shallow, and yet very successful imposition upon the public credulity in a former number, (p. 490, vol. vi.) that it was considered useless to pay any further respect to a matter so small and contemptible, by republishing the more detailed charges and exposures which afterwards appeared in the 'Journal of Commerce.' Well! the result has been that the "Chinese corn," which had been advertised by Thorburn at 25 cents a ear has since been selling under our nose here, as well as elsewhere, at $1 the ear—and bought by hundreds who have had ample opportunity to profit by the notice which we had taken of the humbug.

If our attempted exposures of humbug seeds, &c. actually serve to advertise and give them greater currency with purchasers, we wish at least that *that fact* could be understood by the salesmen of such articles. In that case, perhaps, they might be willing to *pay* for our denunciations, such bribes (direct or indirect) as we have refused to receive as the price of puffs and recommendations.

REPRINT OF VOL. I. OF FARMERS' REGISTER.

The printing of another edition of vol. I. of Farmers' Register has been commenced and will probably be completed within a few months. To those persons who may hereafter send orders and *payment in advance* for full sets of seven volumes, the new edition of vol. I. will be supplied, as soon as ready, at the same price as the others are offered in the conditions, when three or more are bought and paid for at once; that is, at the rate of $10 for every 3 vols. Those persons who have recently bought and paid for full sets, and who could not then be supplied with vol. I, shall have the benefit of this allowance. No copy of vol. I will be furnished at the above price, except as a part of a full set sold, or to complete the set of a subscriber. By the single copy, vol. I will still be at $6, the price at which old and used copies have been bought back by the publisher for the last two years, and which was offered by advertisement, and paid as long as one could be thus obtained. Of the new edition there will be but a small impression, (as it will be wanting only to complete full sets,) and therefore the expense of printing will necessarily be great compared to the returns; and most probably, the sales will not cover the cost. Those who desire to be certainly and speedily supplied with copies, are requested to send their orders and payments as early as may be convenient.

SMITH FUND.

The subscribers to the "Smith Fund" are requested to make payment, forthwith, by checks payable to the order of the undersigned, or in any other manner. The committee will not wait more than a few weeks longer to dispose of the portion already received, even if the much larger balance subscribed should still remain unpaid.

For the Committee,
EDMUND RUFFIN.
Petersburg, Va., March 30, 1839.

STATE OF THE MULBERRY TRADE.

Since our last remarks on this subject, there has not only been no decline of prices, but they have been maintained and even increased, while the commodity bought was in many cases every day getting much worse by keeping, and by the advance of the season. It is astonishing that there should be so little regard paid to the preservation of the healthy condition, and even of the vitality, of the trees and cuttings which are held and sold at such high prices. It would seem as if most of both the holders for sale, and the purchasers for planting, believed that the cuttings would preserve both life and health under any kind of treatment, or degree of exposure. Many will find themselves egregiously mistaken; and many thousands of trees, whether with or without roots, which have been kept for sale, drying through all winter, will either not vegetate at all, or a puny and sickly progeny of plants will be produced from the dried and almost sapless stems and cuttings. Many thousands of other plants will have perished by too much care improperly bestowed for protection; which losses, however, will fall on the holders, as *such* plants will be too obviouly damaged, or spoiled, to be used. Those holders who have refused to sell until the planting cannot be longer safely delayed, and still more those whose stocks are the worse for keeping, must then sell,or lose all; and under such circumstances, it seems not unlikely that there will be a sudden fall in price, in such places as the too great anxiety for higher prices has caused plants to be kept back too long, or where neglect and bad management have caused them to be injured. The holder who cannot use a stock that would perish in a few days, will of course sell at any price rather than lose all. And yet, those who may wait and buy under such circumstances, may find the lowest prices much the dearest in the end. There remain, however, very few for sale in Virginia, and almost none, except such as have been recently sent on from the north.

The planting is already nearly over in lower Virginia, and all farther south; and indeed the buds have so much started that still earlier planting would have been safer. When the planting season is quite over, and no more cuttings can be set out, then will begin the sales of the growing crop. And in regard to these, the public may be prepared for much unintentional deception, as well as gross and designed frauds. The enhancement of price was so sudden last year, that none had prepared to deceive; and no counterfeit article has been yet heard of, except some bass-wood cuttings sold in Massachusetts. But it is so easy to substitute other kinds of mulberry trees and cuttings for the multicaulis, that it will be done to great extent, if the prices should be high enough to invite such frauds. There will be no safety for buyers except in their either seeing the plants when in leaf, or receiving them immediately of the planter, and having in his character, or in other proof, a sufficient guaranty of the absence of fraud. In the manner in which numerous and large sales have been made, the same stock passing through the hands of four or five successive holders between the raiser and the final owner, all responsibility is lost; and if a fraud had been committed, it would be impossible to fix it on the real perpetrator, nor would it have been suspected by the other and honest holders of the stock so adulterated or substituted.

We mentioned *unintentional deception*—which may seem a contradiction in terms. There was, however, much of this during the past season, (and even unavoidably so,) in the circumstances of the same stocks being advertised by several successive holders, and the advertisements being all before the public at once, making it appear that each particular stock or quantity was three or four times as great as it really was. A system much more deceptious, we are sorry to see, has already been commenced, and which may be extended *ad infinitum*. By an advertisement in a Georgia paper, a dealer in Virginia offers to sell *five millions* of trees next November, when the offerer certainly does not own, nor probably has the control of a tenth, if even a hundredth part of the number offered. All that is meant by any such offer as this, when the advertiser has not the trees actually planted and belonging to himself, is, that if he can make an advantageous engagement to sell a number of trees, that he will engage to procure enough to furnish the supply—and thus contrive to make one engagement meet another. But if the very erroneous inference were drawn, that each adventurer actually *held* the trees he may offer to sell, it may appear that there are for sale by our planters a hundred times as many as are actually growing in all Virginia, or even in all the world.

ANSWERS AND EXPLANATIONS TO SUBSCRIBERS.

In answer to numerous inquiries, or remarks, showing mistaken and erroneous impressions of subscribers and correspondents, (some case of which is continually presented,) it is deemed proper to give here the following general answers or explanations; though the same in purport have been repeatedly stated in the conditions, or in other notices to the public.

There are no general agents for the Farmers' Register, nor will any such agency be established, without previous notice, nor is any such measure now designed. Neither is there any *special* or *limited agency*, except to this extent, that the accounts for arrears of subscriptions are, when it is deemed necessary, put into the hands of collectors specially authorized to act. If a subscriber requests any person to give an order of discontinuance, or to pay subscription money, or to do any thing else in regard to the Farmers' Register, that intermediate person *is the agent of the subscriber*, and not ours'; and we are in no respect to suffer by the failure of the person to render the service so requested.

No credit will be hereafter given, or account opened, for sums for which a deduction is allowed for cash advanced. The least reflection will show the necessity for this rule. The prices and deductions for joint and advanced payments are plainly stated in the Conditions; and should any advanced payment miscarry by mail, we are bound to bear the loss, and will furnish the volumes so ordered, upon exhibition of the fact of the lost remittance. Therefore, there is no necessity for, or convenience gained by, not sending payments with the first orders. If any charge for joint subscriptions, or large purchases of volumes, has to be made, it will hereafter always be entered at the regular and full price of $5 the volume.

For the Farmers' Register.

MONTHLY COMMERCIAL REPORT.

The present month has not been one of improvement in the prices of produce. Most articles have declined from the high rates which they had previously attained. Money is less abundant. Tidings from Europe have been less frequent, rather unsatisfactory, and the latest are now six weeks old. The disturbances in Canada have been succeeded by those in Maine, creating apprehensions in the minds of some that our friendly intercourse with Great Britain may be interrupted. Vessels are scarce, and freights high. Speculation, which some weeks ago was active in every article of domestic produce, has been arrested by those causes, fortunately perhaps, for those who were sanguine.

Tobacco has declined about $2 per 100 lbs., and may now be quoted at $7 to 15, although the belief in a very short crop remains unchanged. The price of flour is full a dollar per barrel lower, and country brands cannot be readily sold at $7. Wheat is down to $1 35 to $1 45 cts. Cotton is dull at about ½ cent decline, and now sells at 13¾ to 14½ cts. The receipts in all ports are about 200,000 bales less than in March last.

Stocks generally have felt the unfavorable influence; and in the northern cities, where it has been most prevalent, the decline is very considerable.

The next news from Europe is anxiously looked for, but the political aspect, it is apprehended will be unfavorable.

Exchange on London 9½ per cent. premium.

March 26, 1839. X.

From the American Silk Grower.

LONG PRESERVATION OF THE VITALITY OF SILK-WORMS' EGGS.

I have ascertained here that silk-worm eggs have been preserved in ice-houses for *twenty-two* months, and that they hatched as well as new eggs, by being hatched in a moist air; a too dry air was probably the cause of failure at Burlington last year. S. W. C.

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COUNTRY PRODUCE.

Wheat,	$1 25	Tobacco,	$8 to $16 00
Flour, (superfine)	7	do. (lugs)	$6¼ to $9
Corn, per bushel 85 cents,		Bacon, (hog round)	11 cts.
Cotton,	12 cts. to 14¼		

BRANCH, WINFREE & Co.

TO CORRESPONDENTS AND READERS.

The following communications are on hand: continuation of the "Essay on Vegetable Physiology," by Prof. Armstrong—and "Experiment on the Maryland Twin Corn." We regret that the latter was received too late for this No.; it will appear in the next.

THE MARYLAND

SILK COMPANY,

OF BALTIMORE,

Offer for sale

50,000 Morus Multicaulis, or Chinese Mulberry Trees.
10,000 Alpine Mulberry Trees, selected with care.
5,000 Canton do. do.
5,000 Rose of Lombardy do.
10,000 Other varieties. Apply to

LUTHER J. COX, Pres't.
Nov. 1—R3t Commerce street, Baltimore.

UTILITARIAN,

BY ECLIPSE,

THIS HORSE has been carefully bred with an eye to the useful qualities for the road. The excessive and extravagant estimate put upon the qualities for the turf, (there can be but little doubt,) has produced the present scarcity of fine saddle horses in Virginia.

The leading object of breeding ought to be to produce a race of horses the best suited to the useful and necessary purposes of life. Utilitarian is offered to the public as being worthy of the patronage of such gentlemen as may desire to propagate that class of the noblest of our domestic animals—the sharer and companion of our sports—the aid in our healthful exercises, and the indispensable auxiliary in many of our most important labors—the saddle and the harness horse.

This horse will stand the ensuing season, to commence the 1st April, and end the 15th July, at Bremo, in the county of Fluvanna, and will be limited to 25 mares, (with the privilege reserved of adding five more, without charge, except for feeding, provided five mares of established character as breeders are offered,) at $25, with one to the groom—each to be insured. Mares will be fed at 25 cents per day—pasturage gratis—but no liability for accidents or escapes. The season to be due when the mare is known to be in foal, or is parted with.

Utilitarian is six years old this spring; a fine bay, with no other white about him except a narrow stripe around the coronet of his off hind foot, and a spot in the forehead the size of a dollar. He is 16 hands high; and while he is of the purest blood, which is doubtless essential to every first rate horse of all work, he has the stoutness of limbs and muscular powers of the hunter, with the fine action (to a considerable extent,) of his grand-sire on the dam side, who was incomparably the finest pacer and the most perfect model of saddle horse I ever knew.

PEDIGREE.

Utilitarian was got by American Eclipse; his dam by Roebuck, his grand-dam by the imported Bedford, and his great-grand-dam by imported Diomed, out of the imported mare Jennette; for whose pedigree, see the English Stud Book.

Address Winnsville Post Office, Fluvanna county.
March 31.—R3t JOHN H. COCKE.

MORUS MULTICAULIS,

AND

SILK-WORM EGGS.

200,000 Single Bud Cuttings at three cents each, until a farther rise.
240,000 Mammoth White Silk-worm Eggs.
160,000 Mammoth grey silk-worm Eggs.
160,000 Imperial Mammoth Yellow Silk-worm Eggs.
100,000 Two-crop White Silk-worm Eggs.

For sale, by J. H. D. LOWNES, Ag't.
Richmond Virginia,
Cross street leading to Mayo's Bridge.
February 1st, 1839—R3t&A3t

GRAPES.

100 Cuttings of Brown Malaga, at 50 cents each.
5,000 Cuttings of Norton's Seedling.
5,000 Cuttings of Weller's Halifax.
2,000 Cuttings of York Madeira.

Catawba, Isabella and a general variety of the most approved kinds; persons wishing to stock vineyards will find it to their interest to communicate (Post Paid) with

J. H. D. LOWNES, Ag't.
Richmond, Virginia.
February 1st, 1839—R3t&A3t.

DURHAM CATTLE FOR SALE.

The subscriber offers for sale a full bred Durham bull, six years old this month, bred by John H. Powell (near Philadelphia,) and equal to any he ever raised. His pedigree is in my possession, and may be seen by any one wishing to purchase.

ALSO,

A bull calf of three-fourths blood, and two cow calves, one of seven-eighths and the other o three-fourths. WINTER BRAY.
Near Tappahannock, Essex, Va.
Feb. 28th, 1839.—R3t.

FOR SALE BY

BRAGGS & THOMAS,

SILK-WORMS' EGGS,

Raised in this neighborhood, and of unquestionable good quality.

Petersburg, Feb. 1—R3t&A3t

THE

FARMERS' REGISTER,

A MONTHLY PUBLICATION,

Devoted to the Improvement of the Practice

AND

SUPPORT OF THE INTERESTS OF AGRICULTURE.

EDMUND RUFFIN, EDITOR AND PROPRIETOR.

Vol. VII. APRIL 30, 1839. No. 4.

And he gave it for his opinion, "that whoever could make two ears of corn, or two blades of grass, to grow upon a spot of ground where only one grew before, would deserve better of mankind, and do more essential service to his country, than the whole race of politicians put together." *Swift.*

PETERSBURG, VA.
PUBLISHED BY THE PROPRIETOR.
1839.

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THE FARMERS' REGISTER.

VOL. VII. APRIL 30, 1839. No. 4.

EDMUND RUFFIN, EDITOR AND PROPRIETOR.

IRRIGATION OF LOMBARDY.

From Arthur Young's Notes on the Agriculture of Lombardy.

(Concluded from page 188.)

The same law that has been so effectual in watering Piedmont, operates here also, and has done even greater things. He who discovers a spring, conducts it where he pleases, paying a fixed compensation[*] for cutting through the properties of others. All rivers belong, as in Piedmont, to the sovereign, who sells the waters to speculators for this most beneficial purpose of irrigation. In the distribution of it, by sale, they do not measure by the hour, as in Piedmont, but by the ounce; 12 oz. are a braccio, or 22 inches: an ounce of water is a stream that runs one braccio long and one ounce deep; and the farther the water has run, the higher is the price, as being more charged with manure.

As an example of the beneficial influence of this law, I was shown, between Milan and Pavia, a spring that was discovered two miles from the lands of the discoverer, the properties of many persons lying between him and the spring. He first bought the property of the person in whose land it was situated, which was easily done, as it was too low to be there of any use; then he conducted it by a trench at pleasure the two miles, paying the fixed price for cutting through his neighbors' lands; and, having gained it upon his own, presently changed poor hungry arable gravel into a very fine watered meadow.

Near Milan, a watered meadow sells at 800 *liv.* the pertica, (£32. 15*s.* the English acre;) and the rent of such is about 30 *liv.* (£1. 5*s.* the English acre.) This must not, however, be classed high; for there are lands that rise to 4000 *liv.* (£163 the English acre.) In land at 800 *liv.* or 1000 *liv.* water often makes half of the value; that is, the rent to the owner of the land will be 15 *liv.* to 20 *liv.*; and as much to some other person for the water.

In viewing a great farm, six or seven miles from Milan, in the road to Pavia, I found that all the watered meadow was mown four times; and that what was watered in winter, *prati di mercita*, five times. Such is the value of water here, that this farm, which, watered, is rented at 20 *liv.* the pertica, would not let at more than 6 *liv.* without water, the soil being gravel. The irrigation of the *mercita* begins in October, and lasts till March, when it is regulated like all other meadows. All in general begin in April, and last till September; and if there be no rain, once in seven to fifteen days. An ounce of water, running continually from the 24th of March to the 8th of September, is worth, and will sell for 1000 *liv.* When arable crops want water, it is always given.

Milan to Mozzata.—Every considerable spring that is found, becomes the origin of a new canal. They clear out the head for a basin, and sink casks, by way of tunnels, for the water to rise freely, and without impediment from mud or weeds. There are usually three, four, or five of these tunnels, at the bottom of a basin of twenty or thirty yards.

Milan to Lodi.—Of all the exertions that I have any where seen in irrigation, they are here by far the greatest. The canals are not only more numerous, more incessant, and without interruption, but are conducted with the most attention, skill, and expense. There is, for most of the way, one canal on each side of the road, and sometimes two. Cross ones are thrown over these, on arches, and pass in trunks of brick or stone under the road. A very considerable one, after passing for several miles by the side of the highway, sinks under it, and also under two other canals, carried in stone troughs eight feet wide; and at the same place under a smaller, that is conducted in wood. The variety of directions in which the water is carried, the ease with which it flows in contrary directions, the obstacles which are overcome, are objects of admiration. The expense thus employed, in the twenty miles from Milan to Lodi, is immense. There is but little rice, and some arable, which does not seem under the best management; but the grass and clover rich and luxuriant: and there are some great herds of cows, to which all this country ought to be applied. I cannot but esteem the twenty miles as affording one of the most curious and valuable prospects in the power of a farmer to view; we have some undertakings in England that are meritorious; but they sink to nothing in comparison with these great and truly noble works. It is one of the rides which I wish those to take, who think that every thing is to be seen in England.

Lodi.—Examining some watered meadows in high estimation, I found the following plants most predominant, and in the order in which I note them:—1, *Ranunculus repens*; 2, *Trifolium pratense*; 3, *Chicorium intybus*; 4, *Plantago lanceolata*; 5, *Achillea millefolium*;[*] and about one fifth of the whole herbage at bottom seems what are properly called grasses. These rich meadows about Lodi are all intersected by ditches, without hedges, but a double row of pollard poplars; all on a dead level, and no drains to be seen. They are now (October,) cutting the grass and weeds in the ditches, to cart home for making dung. The meadows are commonly cut thrice; but the best four times. The produce of hay per pertica, 6 *fassi*, of 100 lb. of 28 oz. at the three cuts. Price of the first, 8 *liv.* per fass; of the second, 5 *liv.*; of the third, 4½ *liv.* They water immediately after clearing, if there be no rain. Without irrigation, the rent of the country in general would be only one-third of what it is at present. In forming these watered meadows, they have very singular customs—all are broken up in rotation; flax sown for the first crop, and their way of laying down is to leave a wheat stubble to clothe itself; clover is prohibited by lease, from an absurd notion that it exhausts the land; and that it is not so good as what the nature of the ground gives; but on worse land, the other side of the Adda, they sow clover.

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[*] These laws, relative to the conduct of irrigation, are as old as the republic of Milan; first compiled into a collection of statutes and customs in 1216, (Verri, p. 239.) They were revised and collected, by order of Charles V, and are in full force to this day. Constitutiones Dominii Mediolanensis Decretis et Senatus Consultis. Gab. Verri. Folio, 1747. De aquis et fluminibus, p. 163.

[*] There appeared but few signs of ray-grass, yet it certainly abounds in some of their fields: opinions in Lombardy differ concerning it; Sig. Scannagatta praises it highly, (Atti di Milano, tom. ii p. 114;) but one of the best writers in their language, Sig. Lavezari, (tom. i. p. 82.) wonders rather at the commendations given of it in other countries: he mistakes the French name, it is not sainfoin; the *lojessa* of Lombardy, and the ray-grass of England, is the *lolium perenne*; the French sainfoin is the *hedysarum onobrachis*.

Lodi to Codogno.—All this country the same as about Lodi; a dead level, cut into bits of from three to ten acres, by ditches, without hedges, and planted with double rows of poplars and willows, all young, for they are cut as soon as the size is that of a thin man: here and there one is left to run up to timber. I remarked, in the meadows fed, that the *ranunculus* is avoided by the cows as much as possible. I expected, in one meadow, to find it the *acris*, but much of it was the *repens*. All this country is alternately in tillage; ridge and furrow every where: no permanent meadow. After seven miles, the road being natural, shows the soil to be a loamy sand, binding with rains.*

Codogno.—Thirteen pertiche of watered land necessary for a cow; the hay of which is cut thrice and it is fed once; such land sells at 300 *liv.* free from tax. The whole country is ploughed by turns, being down to clover for the cows four years. 1. Flax, and then millet; 2, maize; 3, wheat and clover; and rests then for feeding cows; white clover comes, but it is bad for cheese. The reader will note, that this opinion differs from that near Milan.

Codogno to Crema.—Crossing the Adda, from the Lodizan, there is more arable, and much fewer cows.

Milan to Vaprio.—In this line there are some dairies, but not many. Near the city there is much grass, all cut into patch-work of divisions, and planted so as to seem a wood of willows; after that much tillage: though all is flat, and there are no great exertions in watering. But the road passes by that fine navigable canal de Martesano from Milan, which, at Vaprio is suspended as it were against the hill, twenty feet above the Adda: a noble spectacle.

Before we quit the Milanese, it will be proper to make a general remark on the conduct of their irrigation, that some evils are observed to attend the practice, for want of a better foresight and more attention; particularly from the gradual enlargement of the carrier canals and ditches; they clean them with so much care, for the sake of obtaining the mud, as a manure, that these are every where become too wide for the quantity of water they convey. Sig. Bignami has written upon this point very rationally, in his dissertation *Sull' abuso di scavare i canali delle roggie ed i fossi nel Lodigiano;* where he asserts, that one-tenth part of their lands is occupied by canals and ditches. The evils are numerous; it is not only a considerable loss of land, but it is an equal loss of water, for when an oncia of a given run of water is purchased, there is a great difference between its first filling a great or a small channel, as in proportion to the size will be the quantity of useless fluid. The atmosphere is also proportionably contaminated; for this great breadth, either of stagnant water, when irrigation is not actually going on, or, what is worse, of mud, in so hot a climate, must be pestiferous; and to this have been attributed the distempers which have frequently made such havoc among their cattle. Another inconvenience is the greater expense of all erections, bridges, sluices, &c. which are in proportion to the breadth of the channels. The remedy is obvious; it is to forbear all cleansing for the sake of mud; to let all aquatic weeds, and other plants, grow freely *on the banks, edges, and sides* of the canals, and to clear them in the middle only. Such a conduct would, in time, quite choak them up, and enable the farmer to keep his canals exactly to their right width. All these plants covering the spaces which, in canals often cleaned, are bare earth or mud, would be very beneficial towards preventing and decomposing that noxious, and mephitic, and inflammable gas, always issuing from such mud, which is so pestulential to animals, yet so salutiferous to plants; for mud, covered with plants that are ready to feed on its exhalations, is much less mischievous than that which is exposed to the rays of a burning sun. Count Carlo Bettoni, of Brescia, has practised a method which acts on similar principles; namely, that of burying or fixing willows or poplars to the sides of the rivers whose banks he wanted to preserve, with the precaution only of keeping the ends of the branches out of water; he finds that they grow vigorously in this situation, and, by stopping the mud of the current, form a solid bank; this, on a small scale, might certainly be executed: also in the canals of irrigation, as it has been remarked, by the author already quoted, in the *Atti di Milano.*

VENETIAN STATE.—*Vaprio to Bergamo.*—There is a mixture of watered meadow in this line, but the quantity is not considerable. In some which are old, I found a good sprinkling of *trifolium repens, chicorium intybus,* and *plantago lanceolata;* but also much *ranunculus* and rubbish. In the plain close to Bergamo, they clean the irrigation-ditches at the end of November, and harrowing them with a faggot, to thicken the water, let it immediately on to their meadows, which is said to enrich them much.

To Brescia.—The Venetian state, thus far, is a considerable falling off from the Milanese, in respect to irrigation; the country is not without canals, but neither the number, nor the importance of them is to be compared to those of Milan. From Coquillo to Brescia, there are many channels, yet the lands are not half watered.

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* As well watered as this country is, yet in the spring 1779 the season was so dry, that, where the Lambro enters the Po, men and women crossed the Po itself on foot, as if merely a rivulet; the rector of Alberoni himself passed it, and the water reached only to his middle. The damage was great every where, but fatal in the Lodizan, where herds of cows were obliged to be sent out of the country to be pastured: the mischief the greater, as from 1774 to 1779 they had augmented their cows 5000, (Opuscoli Scelti, tom, vi, p. 56.) The climate has, however, in all ages, been subject to great droughts. From May 1158 to May 1159. there fell no rain in Lombardy; wells and springs all dried up. The Emperor passed the Adige, with his army, near Verona, without boats; and the Count Palatine of Bavaria passed thus the Po, below Ferrara. Giulina, tom. vi. p. 175.

Brescia to Verona.—The road passes, for some distance, by a very fine canal, yet the quantity of watered land in this route is but inconsiderable. Before we arrive at the Lago di Guarda, there are a few meadows never ploughed, that have a good appearance: but none from the lake to Verona. On the whole, these forty miles, for want of more irrigation, are not comparable to the Milanese or to Piedmont. This route, so much to the north, gives the traveller an opportunity of seeing a chain of considerable cities, and of observing the effects of one of the most celebrated governments that has existed; but a better direction for me, would have been by Cremona and Mantua.

Verona.—The meadows here are cut thrice, and fed once; are never ploughed, if good and well watered. Water for irrigation here, as in all Lombardy, is measured with great care and attention, by what is called the quadrata, which is a square foot, (the Veronese foot is to the English about as twenty are to twelve.) Twelve quadrate are sufficient to water five hundred campi of rice-grounds, (about three hundred and eighty English acres,) and the price of such a quantity of water, is commonly about three thousand *zecchini* (1425*l* sterling.) The wheels in this city, for raising water for irrigating the gardens, are very complete; they receive the water, as in Spain, into hollow fellies. There is one in the garden of the Daniele monastery, for watering about four campi, which are said to yield a revenue of three hundred zecchini; which is one hundred zecchini, of 9s. 6d. per English acre. The wheel raises the water about twenty-five feet, receiving its motion by the stream; a low wall crossing the garden, conveys the water in a trench of masonry on its tops; and a walk passing along the centre of the garden, the wall there is open to admit the path; the water sinking in a syphon, and rising on the other side, to the same height, passes again along the wall, in the same manner as canals are carried under roads in Piedmont, &c. The wheel has double fellies, for giving water on both sides into troughs, which unite in the same receiver, and the washers for giving the motion are placed between the fellies. The whole apparatus, complete, cost three hundred zecchini.

To Vicenza.—There are in this tract of country, some perennial meadows watered, quite upon a level, which have a very good aspect; the existence of such should make us question the propriety of the Lodizan system of ploughing, where water is so regularly at command.

Padua.—The country, from Vicenza to this city, is not watered, like many other districts of Lombardy. The practice is very well known; and there are rice-grounds about Padua, but not nearly the use made of water which is found in the Milanese; yet the rivers in the Venetian state belong to the prince, as well as in other parts of Italy, and water is consequently to be bought: but there is not the same right to conduct it at will, and consequently the water itself might almost as well not exist.

To Venice.—In this tract I saw no irrigation, though the whole is very low, and quite level.

Venice.—The same admirable law, that takes place in the Milanese, for enabling every man to conduct water where he pleases, is found in the Venetian state also, contrary to my information at Padua; but so many forms are necessary, and the person who attempts it must fight his way through so much expensive litigation, that it is a dead letter, and nothing done in consequence. I was farther told, that it is a principle of the Venetian code, that not only all rivers, but even springs, and rain itself, belongs to the prince: an idea worthy of this stern and tyrannical government.

Ecclesiastical state.—*Bologna.*—I saw no watered lands.

Tuscany.—I saw no irrigation in Tuscany; and, from the intelligence I received, have reason to believe, that the quantity is not considerable; some meadows, however, are watered after mowing. The best meadows I heard of, are about Poggio, Caiana, Villa Sovrana, ten miles from Florence.

Dutchy of Modena.—The quantity of irrigated land in the Modenese, is but small; it does not amount to more than six biolche in eighty, nor have they more than fifteen perpetual water-mills in the whole territory. From Modena to Reggio, there is a sprinkling of these meadows, the canals for which, taken from the Lecchia, are not large; all, whether watered or not, are manuring, with black well rotted compost, and have a very neat countenance.

Dutchy of Parma.—The country from Reggio to Parma, is not without watering, but the quantity is inconsiderable; there is, in this line of country, a great inferiority to that from Modena to Reggio; not the same neatness nor attention, in any respect; there are mole-casts in the meadows, a thing unseen before; and though there are much cattle and sheep, yet the features of the husbandry are worse. From Parma to Firenzuola, not an hundredth part of the country irrigated, yet there is a good deal of grass, and in some places in large pieces.

Piedmont.—*Pavese, &c.*—For some miles in the Sardinian territories, there are a good many meadows, but very few watered. I passed two small channels of irrigation, but the quantity was inconsiderable. If a map of these countries be examined, there is the appearance of many rivers descending from the Appenines, and falling into the Po, but the use made of them is small. It is remarkable, that all the way by Tortona, Alexandria, &c. to Turin, the quantity of irrigation, till almost close to the last mentioned city, is quite inconsiderable, not one acre, perhaps, in a thousand. What an idea can be framed of Piedmont, by those who pass through it from Mont Cenis, and quit it for Milan or Tortona, without seeing it from Turin to Coni?

Savoy.—In the mountains of the Alps, by Lanesburg, &c. they mow their watered meadows once only, but in the plain twice.

From this detail of the irrigation of Lombardy, it must be apparent, that, for want of laws similar to those which take place fully in Piedmont, and the Milanese, and partially in the republic of Venice, no such exertions are ever likely to be made in a free country. We can in England form no navigation, or road, or make any trespass on private property, without the horribly expensive form of an act of parliament; we cannot even inclose our own property, without the same ceremony. Nor is it only the expense of such applications, but the necessity of them generates opposition at every step, and a man must fight his way through county-meetings, through attorneys, agents, council, witnesses, and litigation,—in a manner odious to every liberal feeling, and at a ruinous expense, before he is at liberty to improve his own estate, without any detriment to others; every idea of such works, therefore, in England, as we have seen common in Lombardy, is visionary and impracticable; and we must continue to view, with eyes of envy and admiration, the noble exertions which have been made and perfected in that country, and which, in truth, very much exceed any thing we have to exhibit in any walk of agriculture in this island:—an example to hold up for imitation, and an ample field of practical study.

OMISSION.

The following extracts from Arthur Young's '*Notes on the Agriculture of Lombardy*,' had been marked to be included or cited in the "*Essay on Silk Culture*,' in the preceding number, (p. 140.) They show the great extremes of heat of summer and cold of winter in this, the most productive silk country of Europe; and they furnish strong testimony in addition to that which was presented, that the similar extremes, which belong to the climate of Virginia, instead of being opposed to silk-culture, constitute the strongest assurance of its success and profitable returns.

"The great complaint in Piedmont, is the excessive heat in summer; equal, I was assured, to almost any that is felt on the globe, and of a suffocating quality; while the frosts in winter are as severe, in the contrary extreme. The pestiferous climate of Sardinia is known to every body; though between 39 and 41 degrees latitude; in the southern part of the island, they are not forwarder than in the Milanese: they cut their corn in the north part in July: in the Milanese before the end of June."

"The most remarkable circumstance in the climate of Milanese, is the mildness and warmth of northern and mountainous tracts, and the severity felt in the plain. This fact is found particularly around the lake of Como; upon all the western coast of that lake, which is about forty miles long, the *agrumi*, as the Italians call oranges, lemons, &c. are found, exposed to the open air, in good perfection; yet the whole of the lake is bounded by the high Alps, which, immediatly to the north, are covered with eternal snows. On the rich plain of Milan, and thence to the Appenines, no such plant can be left exposed; olives are not seen, and oranges, lemons, and bergamots, must be covered in winter."

"In an experiment made at Vicenza, in the Venetian state, by the Accademia Agraria of this city, they sowed wheat October 18, 1787; came up the 28th; the ears appeared May 2, 1788; the flowers May 13; reaped June 19."

"I was at Florence the beginning of November, and the ice was four inches thick; a severity never yet known in England. The English were, at the same time, skating at Rome."

"One-fifth of all the productions of the earth are calculated to be destroyed by hail and other accidents."

"In the management of the vines in the Parmazan, there is a practice, which shews the constant dread of severe frosts. All the vines are now (in November,) turned down, and the end shoots buried* in the earth to preserve them; yet in a wet season they suffer by this treatment, as well as in all seasons, by being stript from the trees, in order to undergo this operation."

"Mr. Professor Symonds, in the excellent paper quoted above, removed the common erroneous idea of the fine climate of Italy. I made many inquiries concerning the leading facts, and have every reason to believe that it is, in point of health and agreeableness, one of the worst climates in the world: with the views of a farmer, however, it must be confessed, that the productions which the whole peninsula owes to its climate are very valuable. To omit speaking of Sicily or Naples, I may remark, that planting the poor brashy hills of Tuscany with olives is an advantage unequalled by any thing to be met with in the north of Europe; that the produce of silk throughout Lombardy is an object of the first importance—that rice is found to be an article of almost unrivalled profit: that the productive state of the meadows is indebted almost as much to the heat of the summers, as to the plenty of water; and, for any thing I know to the contrary, the admirable quality of the cheese also. These are all objects of great magnitude, and entirely derived from climate."

From the Penny Magazine.

IMPORTANCE OF THE CULTIVATION OF THE VINE IN FRANCE.

Whenever the commercial intercourse between France and England shall be regulated by better principles of economy than those under which it is at present conducted, wine will be the great staple with which the French will make their exchanges for English products. A few statements exhibiting the extent of production in this article in France will not therefore be devoid of interest. In presenting the following facts, it is necessary to state that we have borrowed largely from Dr. Bowring's 'Report on the Commercial Intercourse between France and Great Britain:'—

According to the estimates of M. Cavoleau, who obtained a prize given by the institute for an elaborate work on the vineyards and vines of France, the quantity of vineyard-land in 1806 was about 4,142,600 English acres, and in 1827 about 4,265,000 acres. The calculations of the French Statistical Society show that in 1788 the number of acres in cultivation was 3,986,800 acres, and in 1829 about 5,104,000 acres. The vine-growers estimate the increase of vineyards since 1788 at 28 per cent.

France is divided, for fiscal purposes, into 76 wine-districts, in the same way that England is sub-divided by the board of excise into districts termed "collections." The total superfices of

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* The same practice was known among the ancients. See *Strabo*, lib. vii. and *Quint. Curt.* lib. vii. c. 3.

France is not quite 53,000,000 hectares, the uncultivated lands amounting to nearly one-eighth of the whole. More than one-thirtieth part of France, including the waste lands, is cultivated in vineyards: this is equivalent to about a seventh part of England. If the counties of Bedford, Buckingham, Berks, Hertford, Huntingdon, Middlesex, Oxford, Rutland, Surrey, Westmoreland, and Worcester, were entirely covered with vineyards, the vineyards of France would exceed them in extent by 375 square miles. The distance from London to York is 196 miles; and if the land on each side of the road produced vines, instead of grain and food for cattle, each side of the road to the extent of above sixteen miles must be appropriated to this purpose in order to equal the breadth of land in France which is devoted to the vine; or, in other words, a tract of country nearly 200 miles long and 33 broad.

M. Cavoleau estimated the *value* of the annual produce of the vineyards at 21,615,572*l.*; the Statistical Society at 28,040,000*l*, and in 1788 at only 14,260,000*l.*

M. Cavoleau is of opinion that the *quantity* of wine produced in a year is 812,808,040 gallons, or about 200 gallons an acre. The estimate of the Statistical Society is 998,932.900 gallons, worth on an average 6¾*d.* per gallon; and the production of 1788 is estimated at about 610,750,000 gallons.

The wine-growers are supposed to be 1,800,000 in number.

A commission which was instituted a few years ago to examine into the operation of the tax on wine, which amounts to about 2,900,000*l.* per annum, assumed the total produce to be 924,020,000 gallons, and calculated by approximation the manner in which it was disposed of. They estimated that there was—

	Gallons.
Consumed by the proprietors, not being subject to the duty - -	198,000,000
Employed in the manufacture of brandy - - - - - -	141,680,000
Loss and waste among the growers	91,344,000
Loss in conveyance, and in the hands of dealers - - - -	44,000,000
Exported - - - - - - -	24,530,000
For the manufacture of vinegar -	11,000,000
Duty recovered on consumption is	308,000,000
And the fraudulent consumption is	105,466,000

The loss by evaporation was calculated at 12 per cent. per annum on the small, and 5 per cent. on the large casks.

The total average export of wine is about 22,000,000 gallons, of an average value of nearly 2,000,000*l.*

The district in which the production of wine is carried on to the largest extent, and where the cultivation of the vine is the most advanced, and the qualities of the wine of the highest order, is the department of the Gironde. The superficies of the Gironde is 2,500,000 acres, and the extent of vineyards is equal to 350,000 English acres. The average produce is between 50,000,000 and 60,000,000 gallons, five-eighths of which are red, and three-eighths white wine, the whole, or nearly so, being suited to foreign demand. In very favorable years the production will amount to 75,000,000 gallons.

The value of vineyard property varies very much. The Monton estate, consisting of 135 acres, was sold in 1830 at the rate of 356*l.* per acre: this is the highest price ever paid. The estate of Lafitte, consisting of 262 acres, was sold in 1803 at the rate of 183*l.* 4s. per acre. Both these estates are situate in the Medoc district. About 5154 acres of Medoc wine estates have been sold in the present century; the average amount obtained was 64*l.* per acre. The demand from England for the fine Medoc wines has raised the value of the land which produces them.

The difference in the value of wine of the same vineyard varies exceedingly from one year to another, according to the season being favorable or unfavorable. The produce of Lafitte, Latour, and Chateau Margaux, which are the most esteemed vineyards, has been as low as 4*l.* a hogshead in a bad year. On the other hand, it has, under different circumstances, been as high as 30*l.*

The condition of the population employed in vineyards is an interesting subject of inquiry. A communication addressed to Dr. Bowring by the members of the chamber of commerce at Rheims affords some information on this point, which we subjoin:—In the arrondissement of Rheims the number of vine-proprietors is 11,903. This large number of owners is owing to the division of property; divisions so much the more multiplied, as there is not a single vine-dresser working at piece-work who does not rent some plot of vineyard, and thus the number of separate holders of vineyards is from 22,000 to 23,000. The small laboring proprietors are generally burdened with families, and not well off. They form in society an interesting and very laborious class, making the best appearance they can by severe economy. As soon as there is a promise of a good harvest, they purchase some vineyard-ground, often without prudence, and beyond their means. Afterwards, if bad years come on, they borrow to free themselves. If, in order that they may not mortgage their little property, they have recourse to usurers, they sign and renew bills on very disadvantageous terms. If they borrow on mortgage, the rate of interest is nominally 5 per cent. to the profit of the lender, but in reality from 6 to 7 per cent. at the cost of the borrower, on account of the expenses of the transaction.

In the district where the Macon and Beaujolais wines are produced, the receiver-general of the department of the Rhone gave Dr. Bowring the following account of the condition of the population whose interests are connected with the vineyards:—"Each hectare of vines (nearly 2½ acres) represents a capital of from 5000 to 6000 francs (200*l.* to 240*l.*) on an average. The expense of cultivation may be estimated, every thing included, at about 200 francs (8*l.*) the hectare. The labor of each vigneron (vine-dresser) comprises nearly two hectares, and occupies a whole family. The cultivation of the vine is carried on by an equal division of the produce between the proprietors and the cultivators; the latter are, indeed, a species of participating colonists termed vignerons. This method, by establishing a community of interest between the proprietor and the laborer, tends to render their relations intimate and paternal. It attaches the cultivator to the ground, equally with the proprietor himself, and in some respects removes him from the class of dependent workmen. This class, in general, is not unprosperous: all those who have habits of labor and economy live at their ease. They begin to live rather better than they formerly did; their wants are attributed to the dearness of articles of consumption, of which they are deprived, such as meat, which they very rarely eat, and iron, of which they use large quantities for their farming. They sometimes suffer from the want of sale for their productions."

M. Joannot, the intelligent librarian of the Bordeaux public library, has afforded ample information respecting the moral and social condition of the population engaged in vineyards in the department of the Gironde. He states that the proprietors of vineyards producing wines of the first quality are rich, but the others are not in prosperous circumstances, and if they were not also engaged in farming it would be impossible to support themselves. M. Joannot says that, owing to the ambition of the small land-owners to increase their possessions, they often purchase land at a price very much above its real value. The average daily pay of a vine-dresser is 1*s.* 4*d.*; a woman and child together gain about 7½*d.*; and the most skillful laborer, who provides himself with board and lodging, obtains from 1*s.* 8*d.* to 1*s.* 11*d.* per day. The vintager who is fed and lodged by his employer receives from 7*d.* *to* 1*s.* and sometimes 1*s.* 3*d.* per day. Women and children employed in the vineyards receive half the pay of the men. The workmen attached to the vine-press receive 4½*d.* per day more than the others. In the Medoc district, the vineyard is cultivated on the following terms:—A certain portion of land, generally about seven acres, is divided according to agreement, and it is then managed by the vine-dresser. It is his duty to cut the vines—prune the shoots—to tie them up in bundles and carry them out of the vineyard; and he also attends to all the necessary processes which the successful culture of the vine demands, such as loosening the ground about the roots of the plants, and breaking up the ground in places which the plough could not reach: all the other expenses are at the proprietor's cost. The vine-dresser receives a salary for himself and family of 6*l.* in money, besides half the cuttings, four barrels of a liquor called "piquette," made from the wastage of the wine-barrels, the remnants of the grapes, &c., a lodging, and a small garden. It is usual amongst the extensive growers of the Sauterne and Barsac grapes to employ whole families of vine-dressers to cultivate the crops at fixed wages. Each family is boarded and lodged on the estate, and has a small house, garden, hemp-field, and half the cuttings of the vines collected on the portion of ground they cultivate; and they have, moreover, permission to grow vegetables on several of the furrows in the vineyard. They receive besides, for each man and woman, fifty kilogrammes (110 lbs.) of rye, and half that quantity for each child. The head of the family receives an annual addition of from 2*l.* to 2*l.* 8*s.*; and a child, as soon as it commences working, is paid at the rate of 24*s.* a year.

The manager of a large wine property in Medoc gives nearly a similar account of the condition of the vine-dressers on the estate under his superintendence. A vine-dresser who is the head of a family, and whose wife works, receives from 18*l.* to 20*l.* a year in money, and is provided with four barrels of piquette, lodging, a garden, and land suited for the growth of hemp to supply the family with linen, and he has one-half of the refuse wood of that portion of the vineyard which he cultivates, besides medical attendance and medicines at the cost of the proprietor. This account adds that the ignorance of domestic economy amongst the vine-dressers is usually very great in the department of the Gironde. Another account says that instruction is but little diffused among them. Those who have learned to read when young, no longer think of reading at a more advanced age, although this is exactly the period when the greatest possible advantage would be derived from the perusal of useful books. When yonng, it is stated that they read nothing but the catechism and prayer-book, and a complaint is made that books of a more attractive kind are not circulated. As a consequence of this state of things, they are extremely fanatic, and having few sources of rational amusement and instruction, they either "go to bed early," for want of occupation, or spend their time at the public houses. M. Joannot says they are in general endowed with great penetration, but they are ignorant, superstitious, devoid of religion, proud, setting at defiance the educated and the rich, selfish, little fond of work; yet he states that they are kind and hospitable, adding, however, that family ties have little weight amongst them—the sickness of one of their cattle distressing them more than that of their wife or child. Almost all of them live without care for the future, and die unregretted. This is a disastrous picture of the moral state of so numerous a class, and it will require many efforts to lift them out of that degradation in which they are placed by reason of their ignorance of their own nature, and the duties which are imposed on them. France will soon be covered with parish schools, and the instruction which may be obtained there will, it is to be hoped, do something towards improving their character. We must add, that though thus spoken of, M. Joannot says "their sobriety is worthy of imitation."

In some parts of the department of the Gironde, where the elevation of the country renders the air extremely pure, the men are finely formed, have blue eyes and light hair, and pretty women are common among them. The population of these parts is much devoted to pleasure and dress, and they are of a gay temperament.

In the district where the Macon and Beaujolais wines are produced, M. Delahante, a public functionary, affirms that "it is certain that within the last twenty years civilization has made great progress among the population employed in the cultivation of the vine. There are few of the old people who know how to read, and few of the young who cannot do so."

M. de Brimont, of Rheims, says of the vine-dressers of the Champagne district, that as to education they are on an average with the population of France generally, "but they are more sober and orderly than the manufacturing classes in general."

From the Edinburgh Encyclopædia.

ON SEA-WEED, OR ALGA MARINA.

Sea-weed, a plant that grows upon rocks within the sea, is driven ashore after storms, and is found to be an excellent article for manuring light and dry soils, though of little advantage to those of a clayey description. This article may be applied on the proper soil with advantage to any crop, and its effects are immediate, though rarely of long continuance. As the coast-side lands of the island are, in every case, of superior fertility to those that are inland, we may attribute this superior fertility to the great quantity of manure found upon their shores after every storm or high tide, whereby the resources of the ocean are in a manner brought forward for the enrichment of the lands locally situated for participating in such benefits. The utmost attention has long been paid to the gathering and laying on of this valuable manure; and, from the extensive line of British shores, both of the main sea and of the numerous estuaries which indent, and as it were divide the main land, an immense quantity of sea-weed must annually be collected from them.

Sea-weed is applied at all seasons to the surface, and sometimes, though not so profitably, it is mixed with unrotten dung, that the process of putrefaction may be hastened. Generally speaking, it is at once applied to the soil, which saves labor, and prevents that degree of waste, which otherwise would necessarily happen. Sea-weed is, in one respect, preferable to the richest dung; because it does not produce such a quantity of weeds. Some have thought, that the weeds upon land, which has received dung, are produced by seeds mixed with the dung; but it is reasonable to presume, that the salts contained in sea-weed, and applied with it, may be the real cause of the after-cleanliness. This may be inferred from the general state of coast-side lands, where sea-weed is used. These lands are almost constantly kept in tillage, and yet are cleaner and freer from weeds, than those in inland situations, where corn-crops are not so often taken.

Clay-soils are not so much benefited by sea-weed, as those of a light nature; but whether this is owing to the properties of clay being unfriendly to the admission of the salts contained in sea-weed, or to soils of that description being generally in a state, when this substance is thrown ashore, which physically unfits them for participating of benefit from the application, is not completely ascertained. The fact, however, is certain, that clay-soils are little benefited by sea-weed, though perhaps the poaching of carts and horses upon them, in wet stormy weather, may in some measure, be assigned as the true cause why the same benefit is not gained. When dung is carted out on clay-soils, in a wet state, we know, that the advantage from it is not so great, as when the surface is in condition to bear the pressure of the carriages; though, from that result, no person would be justified, in maintaining, that these soils were constitutionally disqualified to receive benefit from dung. When a coast-side farm contains mixed soils, the best management is exercised, by applying sea-weed to dry, and dung to clay-land. In this way, the full advantage of manure may be obtained, and a farm so circumstanced is of infinitely greater value, with respect to manuring and laboring, than one which contains so much variety.

It has lately been suggested by Sir John Sinclair, Bart. and other eminent agriculturists, that sea-weed possesses a virtue not formerly assigned to it; namely, that it is eminently beneficial in preserving wheat from being mildewed, which, were the fact sufficiently ascertained, would be an addition to our stock of agricultural knowledge, of great importance. Where sea-weed is applied, there can be no doubt that the soil is thereby greatly strengthened, becoming firmer, and, of course, better adapted for preserving the roots of the plant from injury, and for furnishing a regular supply of food. This length we can safely go, as we believe that such an opinion accords entirely with the general sentiments of agriculturists. [illegible]ing, however, that mildew proceeds entirely from a diseased atmosphere, we are at a loss to find out how sea-weed, at the root of the plant, can act as a preventive against that disease, in any other way than what is already mentioned; that is, by consolidating the surface, and giving greater strength to the plants, in consequence of which, they are enabled to resist the unhealthiness of the atmosphere. Comparing the operation of sea-weed with that of dung, it will be found that the effect of the latter is to loosen the soil, and to make it more friable; consequently, as always happens, fields, which have received the greatest quantity of dung, are always most susceptible of mildew.

THE EDITOR OF THE GARDENER'S MAGAZINE.

The two last numbers of Loudon's Magazine contained nothing of interest, unless it may be the following advertisement, which exhibits a very different condition of agricultural editorship in England from that of our country. Mr. Loudon is evidently "in clover," compared to his over-worked and under-paid editorial brethren in this country. We could, (and perhaps may,) present some strong and amusing contrasts to the state of things indicated by this advertisement, in some of the heavy demands made upon our time, and labor of body and mind, by persons who are not even known, and whose names are sometimes not even given, and who seem to think that we are not only competent, but that it is our province and duty, and our pleasure, to furnish information and advice, at any expense of labor, not only on matters of general interest to agriculture, or of special interest to friends, acquaintances, or subscribers, but also to those who have no claim on any one of these grounds.—ED. FAR. REG.

Advertisement.

Since Mr. Loudon commenced the '*Gardener's Magazine*', he has had numerous applications made to him (many of them anonymously), by the readers of his works, for opinions on plans and elevations, or other designs; and for lists of trees and shrubs, ornamental or fruit-bearing, for particular purposes, &c. &c. These applications have considerably increased since the publication of the '*Suburban Gardener*,' and as they begin to occupy more of his time than he can afford to spare gratuitously, he has thought it right to state that, in conformity with the practice of other authors on scientific subjects (see '*Gardener's Magazine*' vol. xiv. p. 526,) he intends to charge for this advice in future, whether given verbally to persons calling, or by letter. For professional visits he has, for the last thirty years, been in the habit of charging at the rate of five guineas a day; and the following scale of terms is founded on this datum:—

A visit to any place not exceeding twelve miles from London, and not occupying more time, including going and returning, than from 9 in the morning to 5 in the afternoon—including all expenses	£5	5	0
Above 12 miles, and not exceeding 20—including all expenses	6	6	0
Above 20 miles, five guineas a day, from the time of leaving Bayswater to that of returning to it, and travelling expenses, by post.			
Consultation by letter, or by the party calling at Bayswater	1	1	0

When plans are sent for correction, subjects for an opinion, or lists of trees, shrubs, &c. are wanted, which it will require a considerable time to prepare, the charge for consultation will be increased in proportion to the time occupied, at the rate of five guineas, for a day of eight hours.

As some persons may not be aware when a personal examination of their premises will be requisite, and when it will be sufficient merely to send a plan and description, with queries, &c. a few examples of both cases are given below.

I.—Cases in which an opinion may be given from documents, without Mr. Loudon visiting the premises:

Pointing out errors or defects in the plans of flower gardens, kitchen gardens, pleasure grounds, or entire residences, whether large or small; and in the plans of hot-houses, pits, and garden structures of every description, whether useful or ornamental.

Stating the defects or advantages of particular modes of heating or lighting hot-houses, and other buildings for plants.

Examining lists of trees and shrubs, ornamental or fruit-bearing; or supplying lists suitable for particular purposes and situations.

Examining plans, elevations, and sections of cottages, farm buildings, and villas of every description.

II.—Cases in which it will be necessary for Mr. Loudon to see the premises before giving an opinion:—

Where the general scenery of a place is to be examined, with the view of ascertaining what improvements it is susceptible of.

Where an entirely new place is to be formed; unless the ground should be perfectly flat, and without any distant view.

Where it is desired to ascertain the causes of the defects of an old place: such as the cause of the barren state of the fruit-trees, or of the defective crops of the kitchen garden or orchard; or of the inefficacy of the mode of heating, lighting, or ventilating the hot-house, &c.; of sterility of the pasture land, unthriving state of the timber, &c.

Where it is desired to ascertain whether a place is well kept, or whether it could be altered so as to be kept at less expense; or to point out defects in the mode of keeping and managing the walks and their edgings, and the lawn, flowers, shrubs, &c.

Whether the addition of a piece of water to a park or pleasure ground would be an improvement; how far it is practical to form such a piece of water; and what character it ought to assume.

Where the agricultural surface requires improvement, or the plantations are to be examined.

No opinion will ever be given by Mr. Loudon, whether verbally or by letter, without assigning his reasons for forming it.

When any plan given by Mr. Loudon is approved of, he can, if required, send a competent assistant to stake it out on the ground, and to describe the manner in which it is to be executed; for which the charge will be a guinea a day, with travelling expenses. J. C. L.

Bayswater, *October* 16, 1838.

From the New England Farmer.

EXTRACT FROM PROCEEDINGS OF EIGTH AGRICULTURAL MEETING IN MASSACHUSETTS.

* * * * * *

The report above named placed the value of ruta baga for fattening cattle, for milch-cows, for swine and for horses at a very high rate. Mr. Brigham of Westboro expressed himself as strongly differing from the opinions expressed in the report in respect to their value. He was disposed to value roots at a high rate; but there was danger that farmers might expect too much from them; and he wished to guard them against disappointment. He had in the course of his farming raised from 1000 to 1100 bushels to an acre of ruta baga; and of carrots from 700 to 1200 bush.

He had used his ruta baga from cows in milk. They will not double the quantity of milk as the report stated; but they will increase it considerably. He thinks, however, that the quality of the milk is injured by their use; and that the milk of cows fed upon them will produce but little cream. He had found them of use in fattening beef. On the whole, however, he deemed them greatly inferior to carrots. Carrots he estimated very highly. They were difficult or rather expensive in cultivation; but if successful, they amply repaid any expense or labor bestowed on them. They were an excellent crop for horses. He did not coinside in the opinion, stated by the commissioner, of Mr. Merrill of Lee, who said that for feeding horses he should prefer one hundred bushels of carrots and one hundred bushels of oats to two hundred bushels of oats; yet he deemed them excellent, and much the best root-crop raised among us. He had found it likewise much easier to keep carrots than to keep ruta baga. Of their value for fattening beef or swine he had no knowledge.

Mr. Danforth of Pittsfield, stated a case within his own knowledge in which the raising of carrots cost at the rate of eight cents per bushel. Other gentleman stated that they had been produced in the state in large quantities at the rate of 6¼ cents per bushel.

Mr. Abbot of Westford, was disposed to value ruta baga much higher for milch-cows than Mr. Brigham. In his own experience for the increase of butter, where he had tried cows in successive weeks upon pumpkins and ruta baga, the increase of butter in the use of the latter root was as 14 to 10. A gentleman of Portsmouth, N. H., within his knowledge had compared the value of carrots with potatoes in fattening beef; and in this experiment, thirty bushels of potatoes proved equal to sixty of carrots. It would have been very instructive if Mr. Abbot could have given the particulars of both of these experiments more fully; this we hope he will do, and we shall be happy to make the 'N. E. Farmer' the vehicle of such communications.

Mr. Perry of Bradford, spoke next of the value of roots. In relation to the keeping of vegetables he thought a good deal depended on the nature of the soil in which the cellar, where they were stored, was dug. It often happens, he says, that ruta baga will not keep in the same cellar in which potatoes and carrots may be kept. Of the value of ruta baga he gave an illustration by an anecdote in which he was a party. He had been accustomed to supply a neighbor of his with milk. His neighbor inquired one time why the milk was not as good and as rich as it had been. Now this inquiry was made at a time when he had ceased to give his cows ruta baga, with which before they had been liberally supplied.

Mr. Buckminster spoke highly of the value of roots; but seems to be as hostile to potatoes as the late William Cobbett; from which it is but natural to infer that he has no Irish blood in him. He deems grain crops an exhausting crop, and potatoes particularly so. He thinks the evil complained of, by which the milk was injured in its taste, was occasioned by giving the animals too much.

The chairman stated that within his experience it would be safe to feed a bushel per day to an animal, provided they were kept at the same time on salt-hay.

Mr. Buckminster pronounced potatoes a very exhausting crop, and the cultivation not to be encouraged. To an inquiry as to the amount of potatoes usually raised per acre, he replied from one hundred to one hundred and fifty bushels, and gave it as his belief that the crop in Framingham did not exceed one hundred bushels.

Mr. Bruce of Grafton was disposed to defend the potato-crop; and pleasantly remarked that if he obtained not more than one hundred bushels per acre, he should be quite disposed to give them up. In his own cultivation he considered 200 bushels a light crop—350 bushels a good crop. He had raised 564 bushels to the acre, and was accustomed to use 40 bushels of whole potatoes for seed. He is accustomed to plant them in hills. He said the crop of one of his neighbors had exceeded 700 bushels to the acre. These were certainly cogent arguments in reply to the Framingham farmers.

Potatoes are without question an exhausting crop, and return little to the land, the tops amounting to a small matter. In our practice they are far from being an ameliorating crop, because they are cultivated in the most slovenly manner; they are in many cases not hoed more than once, and the weeds afterward usually abound, and cover the ground with their seeds. This however is altogether the fault of the cultivator, and not the crop. In neat and clean husbandry and at a yield of four hundred bushels to the acre, (and with less than this even the Framingham farmers ought not to be satisfied) they are a valuable crop; and an acre of potatoes will furnish a great amount of most nutritious food for man and beast; though Cobbett insists upon it they are nothing but so much dirt and water.

Mr. Denney of Westboro, stated that he had fed his cows with carrots and ruta baga; and that in changing from carrots to ruta baga the quality of the milk immediately became deteriorated.

EXPERIMENT WITH THE MARYLAND TWIN-CORN.

To the Editor of the Farmers' Register.

Chericoke, King William County,
March 23d, 1839.

As I believe the merits and demerits of the Maryland twin-corn, is still a mooted point, among my brethren of the corn planting and raising craft of lower Virginia, it may not be entirely uninteresting to some of the vocation, that I should state the result of an experiment made by me last year. I have now been planting the twin-corn four years, procured from Col. Mercer, of West River, Maryland, and doubtless the same corn as recently advertised by Mr. Sinclair, of Baltimore, as the "true tree prolific corn." But with entire deference to Mr. Sinclair's better judgment in the matter, I think he has given the corn a misnomer, and misrepresented some of its characteristics; it is undoubtedly a very prolific variety of corn, and it is very white, but I have as yet discovered nothing of a *tree character* about it; and it certainly matures from a fortnight to three weeks earlier in the tide-water country of Virginia, than the common corn grown with us. Like all other corn that I have heretofore met with, it is true, that it flourishes better, and produces more, in rich land than poor; but still my experience leads me to believe it as well adapted to the one as to the other, and that it will be found to produce on any land under similar circumstances, more than the usual varieties. Its advantages, as I think, consists in its being more productive, more forward, less liable to rot in the field, heavier than any kind we grow except the hominy corn, and consequently yieding more meal; and certainly one great advantage it has over most other kinds, it yields from five to ten per cent. more in shelling from the cob. It will resist the weevil too, longer than most corn grown with us, and the meal and hominy made from it, is generally allowed to be very superior. The stalk being smaller, it of course resists the drought better than the larger corn, as I had full proof the two last summers. As before stated, I have been growing the twin-corn for four years, and for two years previous to the last, (1838,) I had planted no other kind, and was well satisfied with the results, but some friends, in whose judgment and experience I had great confidence, as farmers, insisted upon it that I was deceiving myself, that it would not produce as much as the common corn of our country, determined me that I would make a fair experiment with it, and one of the best varieties of the common corn grown in my neighborhood, highly esteemed by the friend from whom I obtained it, as well as others, they being confident it would produce more than the twin. When planting, I directed my manager, (an intelligent, observing, and attentive young man,) after laying off a piece of land ready for dropping the corn, the rows being all of equal length, to count the number of rows, and plant one half of the common, and the other of twin-corn. There proved to be 103 rows in the piece; he planted 52 rows in the common, and 51 in the twin, the distance both ways the same, 5½ feet by 2, all planted on the same day, in the same manner, and the culture throughout the year the same. The land was all pretty good for this section, but that on which the common corn was planted, I think rather the best. I have recently measured the piece of ground, and find it to contain 19 and a fraction acres. We were at every pains in gathering and measuring the corn, to avoid any mistake, and the result was, that the common corn made 58½ barrels, and the twin 99, from the 9½ acres each. I also tried on another farm a similar experiment, and the result was fully as conclusive. Some now object that the season did not suit the common corn; but I presume it was equally "fair for the goose as the gander," if the season had been more propitious, each, doubtless, would have made more. In consequence of the stalk being smaller, many think that the twin corn should be planted thicker than the common, but that I think a mistake, as I have always found there was double as many shoots on a stalk, as it could mature, and that it always bears in proportion to any reasonable distance you may give it, and the strength of land and seasons; I therefore, plant mine generally, as I would any other kind of corn, by giving distance sufficient; the ears are larger, and it is the better enabled to stand a drought, there being always more shoots than the stalk can mature, they will fill out, as the land and season may allow.

As the twin-corn has become more acclimated, the ears have become larger, and perhaps it may not be quite as forward as it was when I first got it; but in all other respects it appears to retain its original character—certainly its fecundity.

CORBIN BRAXTON.

THE LAW OF GEORGIA FOR ENCOURAGING SILK-CULTURE.

(Passed December 29, 1838.)

Whereas it is desirable that the culture of Silk should be encouraged within the limits of the state:

Be it therefore enacted, That from and after the passage of this act, whenever any person or persons, either individually or collectively, shall raise any silk within the limits of this state, he, she, or they shall be entitled to draw from the state treasury, a premium of fifty cents, for each and every pound of cocoons, so by him, her, or them raised, and ten cents per pound on each pound of good silk by him, her or them reeled from cocoons so raised, and the person or persons, so claiming the premium aforesaid, shall first exhibit the cocoons raised, and the silk reeled as aforesaid to one of the justices of the peace, within the county where the same shall have been raised, and the said justices shall thereupon examine the person or persons claiming the premium, as aforesaid, upon his, her, or their oath or legal affirmation, and shall require the party so claiming the premiums to swear or affirm, that the cocoons were raised in the state of Georgia, after the passage of this act, that the premium has not before been claimed by or paid to, any other person, for said cocoons or silk; and in relation to all other facts and circumstances, as may, in the opinion of said justice be connected with the raising or reeling of the same: and upon such evidence proving satisfactory to his mind, he shall thereupon make out and a sign a certificate with his seal thereunto annexed, which certificate shall be sufficient authority to his excellency the Governor, and he is hereby required to receive in his department the same, to whom said certificate is granted for the amount of said premium, as per said certificate to be paid out of any money not otherwise appropriated. This act shall be and continue in full force and effect, for and during the term of ten years, from and after its passage.

For the Farmers' Register.

ESSAY ON VEGETABLE PHYSIOLOGY.

[Continued from page 174.]

CHAP. VII.

GROWTH OF THE STEM IN LENGTH AND DIAMETER. GROWTH OF THE CELLULAR SYSTEM. GROWTH OF THE FIBRO-VASCULAR SYSTEM. THEORY OF DU-PETIT-THOUARS.

Having examined the internal structure of the stem, at some length, in the last two chapters, we will now direct our attention to the manner of its growth. A stem attains its full size by a double growth; first, in length, and second, in diameter.

A young shoot elongates, not by its extremity only, but throughout its whole length. We may satisfy ourselves of this in several ways. If we mark a young shoot, early in the season, at equal and known distances, and then examine it at intervals of a week or two, we will find, that as the shoot increases in length, the distance between these marks will increase proportionably. Or we may learn the same thing, by simply observing the distances between the leaves of a shoot at different times during its summer's growth. At first, the nodes, or points at which the leaves are inserted into the stem, are very near each other, and the leaves almost touch. As the shoot increases in length the leaves will be found further and further apart, though still maintaining the same relative distance from each other which they had at first. The growth of the young shoot proceeds in the way thus indicated, until it has attained its full length for the season. It afterwards undergoes no change in length; but its future growth depends upon the production of a bud upon its summit. This bud developes in the same way as the first year's shoot, and in its turn produces a bud, and in this way the stem goes on increasing in length from year to year.

That the upward growth of the stem takes place altogether in the green shoot of each year, whilst the older portions of the stem undergo no change in dimensions, is proved by the following fact, known, I presume, to all. When a name is cut upon the bark of the beech tree (*fagus sylvatica,*) the tree may continue to grow until it has doubled its original height, but the name will never be raised further from the ground than the point at which it was originally cut. This process is the same both in exogens and endogens. It generally happens, that some of the buds with which a stem is furnished at the axil of every leaf, grow, and originate branches. When this is the case, the growth of these branches is precisely similar to that of the stem from which they sprung. The only thing which seems at variance with this account of the growth of a stem, is the absence of all branches from the lower part of it, that part commonly called the trunk. From this, some have inferred, that the portion of the stem which was originally included between the root and the lowest branch formed, which is generally not more than a foot or 18 inches in length, has subsequently expanded into the trunk. The true reason why there are no branches on the trunk, is, not that branches were never formed there, but that after they were formed, they have died and disappeared, from the operation of causes, which have been already explained, when treating of the tendency manifested by stems to a perfect regularity of growth.

The increase of a stem in diameter is owing, first to the developement of the cellular tissue, which grows in every direction; and second, to the production of the vascular and woody tissues. The horizontal expansion of the cellular system, is simultaneous with its growth in an upward direction, so that a young stem increases in diameter to a certain extent, at the same time that it grows in height. To this cause, the horizontal increase of the stem, during the early part of the season, is due. When the elongation of the stem has proceeded for a month or two, the formation of wood commences, and its deposition, either in bundles or layers, continues during the remainder of the growing season. All must have noticed the increased toughness of a shoot after it is a month or six weeds old. This arises from the formation of woody fibre, which commences about that time. As this fibre is deposited under the bark, it must of necessity increase the diameter of the stem; and to its formation, no inconsiderable portion of the increase in that direction, is owing. Such is a general account of the growth of the stem. We will now examine the subject a little more particularly.

As the cellular and vascular systems of plants grow in ways entirely different from each other, we will have to consider them separately. And first, we will attend to the growth of the cellular system. The best observations on this subject are those of Mirbel, contained in two highly interesting papers communicated to the French Academy of Science, during the years 1831-2. The plant on which he made his observations, was the *marchantia polymorpha;* a plant which is frequently to be met with in Virginia, growing in the immediate neighborhood of springs. It has no regular stem, and is in fact, nothing but a green leather-like leaf, irregularly lobed, and springing up in wet places only. His reasons for selecting this plant were, first, it is a cellular plant, containing no vascular or woody tissue, and on this account the better fitted for observation, when the manner of growth peculiar to the cellular tissue was to be ascertained. Second, it grows easily, requiring nothing but common water, and the access of common atmospheric air, to ensure its rapid increase; and third, its seed, or spores, as they are termed by botanists, consist of a single cellule each. The common puff-ball or snuff-box, as it is perhaps more commonly called, (*bovista nigrescens,*) is a cellular plant. If one of these, when ripe, be pressed by the foot, an exceedingly fine slate-colored powder flies out from the opening at its summit; the grains of this powder are the seeds, or spores, of that plant; and the seeds of the *marchantia,* are exactly like them, except in color. Had the botanist the power of creating a plant, for the especial purpose of making observations on the growth of the cellular system, he could not have made one better adapted to the purposes than the *marchantia polymorpha.*

Some of these seeds were laid upon moistened plates of glass, and placed in a warm damp room. When examined, after an interval of four or five days, a projecting point was noticed on each of them, which soon elongated into a slender tube. This tube then swelled out at its extremity, and became a second cellule, in every respect like the first. The newly formed cellule soon emitted a tube, and this grew into a cellule; and so the work went on. The plant, at first, appeared like a knotted cord; next, it seemed a shapeless mass of green matter; and finally, became leaf-like, and assumed the appearance of a perfect plant. According to the observations of Mirbel, there does not appear to be any fixed point at which a cellule shall give rise to another; and of course, a mass of cellular tissue may increase in every direction equally well. This is in accordance with the fact already mentioned, that the cellular system of a plant grows in all directions at the same time. Cellules, in some instances, produce others at a very rapid rate. Some species of mushrooms, plants composed entirely of cellular tissue, have been known to grow in a single night, from a mere point, to the size of a large gourd. In such a case, if the cellules are of the medium size, they must have been produced at the average rate of 4,000,000,000 per hour; a rate of increase so rapid, that we could hardly believe it, did not calculation show us that it must indeed be true.

Concerning the growth of the fibro-vascular system, *i. e.* the vascular tissue and woody fibre, there has been great diversity of opinion among botanists. By far the greater part of the observations which have been made, for the purpose of examining into this matter, have been made on exogenous plants; to these, therefore, our attention must be principally directed. But yet it should be remarked, we can admit no explanation which does not apply to endogens, as well as to exogens. The origin of the fibro-vascular system, is presumed to be same in both cases; and so also its developement, except in the single particular of its arrangement.

There are certain facts respecting the production of the wood, which have been established by careful and oft-repeated experiments. To these we will first attend. The first of these is, that the wood, or at least the material of which the wood is formed, is elaborated in the upper part of the plant, and sent downward; and not in the root, and sent upward. This has been established by such experiments as the following: "Early in the spring, a tight ligature was tied around a young branch; and in this condition the branch was suffered to remain for the season. On examining it towards autumn, the part above the ligature, was found to have increased in size, whilst that below had remained unaltered. A ring of bark was removed from a growing stem of a young tree. When the wound commenced healing, the new woody matter was formed on the upper lip of the wound, and not on the lower." Second, the new wood is produced, either from the bark, or between the bark and the wood of the last year, and not by that wood. This was proved by Du Hamel in the following manner: Having carefully introduced plates of tin-foil, between the bark and wood of a growing tree, he suffered it to remain undisturbed for several years. On cutting across the stem, at the end of this time, he found that the new layers of wood had been deposited on the outside of the tin-foil, without in the least disturbing it. Third, the origin of the wood is in some way intimately connected with the action of the leaves. It has long been known that the diameter of a stem depends very much upon the number of leaves which it bears; that the larger the number of leaves developed upon a stem, the greater will be its diameter, and the more rapid its growth. And also, that the largest quantity of wood is always found on that side of a stem which developes most leaves. But had we only these facts, on which to base a judgment, we might hesitate which to consider the cause, and which the effect; whether to believe that the luxuriance of the stem arose from the increased number of leaves, or the increased number of leaves from the luxuriance of the stem. This question, however, has been determined by direct experiment. Mr. Knight stripped off the leaves from the upper portion of a young shoot; as the consequence, the shoot died as far down as the leaves were removed, whilst below that point, it flourished. He afterwards, insulated a single leaf, by removing a ring of bark, at some distance above the point at which it was inserted into the stem, and another at an equal distance below that point. In the course of the summer a perceptible increase in the wood took place above the leaf, but none below it. In another instance, he removed a narrow ring of bark from the lower part of a growing stem; the stem afterwards increased sensibly in diameter down to this ring, but not at all between the ring and the leaf next below it. From these and similar facts, he has inferred, that "the matter of which the wood is formed, is elaborated in the leaves and sent downwards." Fourth, the portion of wood formed each year, is entirely independent of, and distinct from, that of every other year; and when once formed, undergoes no change, except the slight change which takes place when it is converted from sap-wood into heart-wood. In confirmation of this, many curious facts may be mentioned. On what are called "line-trees," in the west, certain marks are made when the land is first divided off into lots. This is done by striking with an axe, so as to cut through the bark and two or three of the outer layers of the wood. If one of these trees be examined, say twenty years after the marks were made, no traces of them will be discovered on the outside of the bark; nor, if we cut into the wood, will we find any in the 19 outer layers; whilst we will find all the marks perfect in the 20th layer, the layer in which they were originally made; thus establishing the fact that, that layer has remained unaltered since its first formation, and that all the outer layers have been formed entirely independent of it. Good, in his 'Book of Nature,' states that in England, "dates of very remote national eras, and the initials of monarchs who flourished in early times, have been found stamped in the very heart of the timber." M. Klein states that in the year 1727, a long series of letters were discovered in the trunk of a full grown beech, near Dantzic. The letters were conspicuous in a layer about half way between the axis and the bark of the stem, whilst no traces of them could be discovered, either in the layers within, or in those without it. The same author mentions several other facts of the same kind. "In one instance, the image of a thief hanging from a gibbet, was discovered, in the timber of a beech tree, apparently drawn by nature's own pencil. In another tree, the figure of a crucified man, was found in similar circumstances; and in another, a chalice, with a sword perpendicularly erect, sustaining a crown on its point. Such marks were formerly attributed to miraculous intervention, or regarded as marvellous sports of nature; and on this account, were preserved with peculiar care." When rightly understood, they place the truth of the above statement beyond a doubt.

Bearing these facts in mind, we will now attempt to decide between the two theories respecting the formation of wood, which, at the present day, divide botanists. Only two theories are mentioned; for although, in time past, many theories have been advanced, there are now but two which are considered at all probable. One of these theories is, that the wood is produced from organizable matter, elaborated in the leaves, and from them sent down, through the liber and alburnum, and thence deposited between the two in the form of new wood and bark. The other theory is, that the wood is nothing more than the roots of the leaves, growing downward from their bases, just as true roots grow from the base of the stem. The first of these theories is adopted by Mirbel, and De Candolle; the second was first advanced by Du Petit Thouars, and has lately been very ably defended by Prof. Lindley.

One of the arguments urged by the advocates of the first theory, is this: "If a ring of bark is removed from a maple tree, whose wood is white, and its place carefully supplied by a ring of bark from a maple, whose wood is red, the bark will adhere to the old wood, uniting organically with it, so that externally, the wound will be scarcely seen. If the tree thus treated, be allowed to grow for a year or two, a quantity of wood generated in the leaves, will be found beneath the ring of the red wood maple bark. If it be but the roots of the buds and leaves furnishing white wood, it should be white also. But it will be found that red wood will be formed beneath the red wood bark; therefore this wood is formed immediately by the bark, from materials sent down by the leaves." To this, Lindley replies, "the color of young wood depends entirely, and of old wood in a great degree, upon the cellular system, and not upon the fibro-vascular system;" and according to both theories, this grows horizontally, the new portions originating in the cellules of the bark. There is another fact, which Mirbel has urged against the second theory, and in support of the first. "Suppose," says he, that a scion of *robinia inermis* has been grafted for a long time, say 30 years, upon a young stem of *robinia pseudacacia*, or common locust, cut off six or eight feet from the ground. According to the theory of Du Petit Thouars, what has taken place during the thirty years which have elapsed since the grafting? The leaves of *robinia inermis* have each year sent out roots, which, under the form of a layer of wood, have insinuated themselves between the wood and the bark of the *robinia pseudacacia*, extending quite to the earth. Thus the trunk has successively acquired thirty layers of the wood of *robinia inermis*, since they have been produced by the leaves of that species; and these layers, one after an other, have been divided in the soil, and spread in the form of roots, which are also those of *robinia inermis*. Now if we cause these roots to develope buds, and thus form new stems, we should, according to this theory, obtain stems of *robinia inermis*. But such is not the fact. These roots give rise to stems of the *robinia pseudacacia*; and consequently, their specific organization is that which is peculiar to the latter species." To this objection of Mirbel, an answer of the same kind, as in the last case, may be given, viz.: that the roots are really those of the *robinia inermis*, so far as the fibro-vascular system is concerned; but that the specific power of originating buds, lies in the cellular system, and both theories regard that as produced from the cellular system of the original stump of *robinia pseudacacia*.

The great objection to the first theory, *i. e.* the theory which regards the fibro-vascular system, as organized matter deposited by the bark, is, that it does not account for the growth of endogens, plants which have no regular bark; or if we consider the external covering of the stem as the bark, which form their fibrous bundles, without their having any connexion with that bark. As has been before remarked, we can admit no explanation which does not account for the growth of endogens, as well as exogens; the separate portions of the fibro-vascular system being precisely similar in the two cases, excepting in the one particular of their arrangement; their origin and mode of developement is presumed to be the same.

To the theory of Du Petit Thouars no such objection can be urged; it accounts for the growth of both kinds of stem equally well. And here it may be worth while to state this theory, as modified by Prof. Lindley, a little more at large. "A plant, in the first stages of its growth, is considered a mass of cellular tissue, capable of expansion, and growth in all directions. When there is no leafy system, growth is indefinite; and not carried on in any particular direction, and no woody system is formed; but when leaves are developed, they send their organic fibres down through the mass of cellular substance, and arrange them sometimes in one way, sometimes in another, according to the specific power of the plant. Upon this supposition the stem of a woody plant will be composed of two essentially distinct systems; the one cellular, constituting the pith, the principal part of the bark, and the medullary processes (if in an exogen,) and capable of growth in all directions; the other fibro-vascular, comprising the wood and a part of the bark, and capable of growing longitudinally only." "The stem of a tree has been quaintly, though not inaptly, compared to a piece of cloth; the cellular system representing the woof, and the fibro-vascular system the warp." The observation which seems first to have suggested this theory to Du Petit Thouars, was his noticing in the case of the *dracena*, (a plant used for forming hedges, in the Isle of France, where he then resided) the manner in which a bud vegetated upon a stem otherwise dead, a thing which frequently happened, the bud having no longer a series of vital systems, with which it might combine, sent out undoubted roots beneath the bark, instead of the woody fibres, which it would have emitted under ordinary circumstances. And also, that in cases, when the wood had died, the living buds formed a sort of entangled sheath of roots, by the fibrous matter which they sent down.

In support of this theory, Professor Lindley urges the following facts. "If you take the branch of a lilac (*syringa vulgaris*) when it is just clothed with leaves, and while the bark will freely separate from the wood, and peel it, you will find ridges of tubes, passing down from each leaf, turning aside at every little obstacle, re-uniting after the obstacle is passed, and together forming a firm fibrous case to the subjacent wood of the previous year. In other plants, the fibres may be traced in like manner from the leaves; but instead of running parallel with each other, they cross each other diagonally, and form a sort of lozenge work. This is wholly inexplicable upon the supposition that the wood is deposited by the bark; but it is clearly intelligable, if the wood is regarded as an organic emanation from the leaves. Again, in endogens, the woody fibres may be distinctly traced into the leaves, from which it is plain that they originate; and in this case at least, it is manifest, that the woody bundles, cannot be organized matter, deposited by the bark; for they are in the centre, whilst the bark is at the circumference." In addition to this, we may mention the fact, that when plants are propagated by means of slips, the new roots always protrude from between the outer layer of wood and the bark, which is just the situation from which they should grow, if this theory be the correct one. Du Petit Thouars attributes to leaves and buds, a power similar to that possessed by the seed, of sending a stem in one direction, and a root in another. The root of the leaf, however, differs from that of a seed, in being intended to grow in the trunk of the plant producing it, and not in the earth. This theory furnishes us with a very simple explanation of the manner in which a bud or graft is enabled to live, and incorporate itself with the stem of another plant. In inserting a graft or bud into the stem of a plant, we are placing it in as proper a situation for it to grow, as we are a seed when we place it in the earth. It will also show us the reason on which certain practical rules to be observed in grafting and budding, are founded. One of these rules is, that we must make the bark of the graft and that of the stock, coincide exactly with each other; and if the barks are of different thicknesses, the inner surfaces, and not the outer must coincide. This is evidently necessary, in order that the "leaf-roots" growing down between the bark and the wood of the graft, may enter between the bark and the wood of the stock. Another rule is, that both in budding and grafting, we must place the bud or graft upon a stock which has a bark similar to its own, and upon no other. By a similar bark, we mean one which has the fibres of its fibro-vascular system arranged in the same way. If these fibres lie parallel in the bark of one, they must lie parallel in the bark of the other; if they cross each other in one, they must cross each other in the other also. Thus, we may graft a pear upon an apple stock, or an apple upon a pear stock; but neither of them upon a peach stock. We may bud a peach upon a plum, or a plum upon a peach; but neither of them upon an apple. If we graft a shoot, the fibres of whose bark lie parallel to each other upon a stock the fibres of whose bark cross each other, the fibres of the former in growing down among those of the latter, become entangled and cannot proceed far. Another rule is, to graft or bud before the leaves have put forth. The reason for this rule is, that then the roots from the new leaves have not as yet put forth, and of course are not injured.

Such are some of the facts by which this theory is supported; and such are some of the applications which may be made of it, for the purpose of explaining phenomena presented in the vegetable kingdom. Still it must be confessed that the arguments in its favor, are not so convincing as could be desired; and moreover that there are some objections to it, which do not admit of so satisfactory an explanation, as those already mentioned. One of these, and the most weighty one too, is, that when a deep cut is made into one side of a tree, the leaves which are perpendicularly above it, do not always, or even generally, die. Nor if after the leaves are fairly formed, each one has its own proper root, extending down into the ground, we must of necessity, in cutting into the tree, cut off the roots of many of them; and their life should be destroyed as the consequence. The only answer which can be given to this, is, that although in ordinary circumstances, each leaf is sustained by its own roots or fibres, yet, in extraordinary circumstances, it may derive its nourishment from the soil, through the intervention of those of other leaves. Or, carrying out the figure which Du Petit Thouars has used, in calling a tree a community of leaves, although each leaf, while hale and sound, must labor for its own subsistence, yet when injured or disabled in any way, it is supported by a tax levied upon its neighbors.

This theory, if we adopt it, will present the vegetable kingdom to us in a light very different from that in which we are in the habit of regarding it. We can no longer look upon a tree as an individual in that kingdom; so far is it from being such, that it is in fact, a vast collection of individuals, all united under one common cover, and for one common purpose. Each generation of leaves, borne up upon the shoulders of those preceding it, is raised into the air, and better fitted for performing its vital functions. This subject is one which, among botanists, is exciting a good deal of interest at the present time. It is always pleasant, and generally profitable, to know what are the current subjects of investigation; even though but little is, as yet, known respecting them; to see in what direction mankind are pushing their discoveries, even though they have, as yet, proceeded but a little way. This must be my apology for occupying so much space as I have, with a discussion of these theories.

Chap. VIII.

LEAVES. THEIR GENERAL STRUCTURE. ARRANGEMENT OF THE CELLULAR AND FIBRO-VASCULAR SYSTEMS IN THE LEAF. OFFICE OF THE LEAF. DISPOSITION OF LEAVES ON THE STEM. FALL OF THE LEAF.

The third, and last, of the organs of vegetation, are the leaves. In examining this class of organs, the same order will be preserved, as in the case of the root and stem; attending, first, to their external forms and internal structure, and then to their uses and manner of growth.

The leaf, like the root and stem, consists of a cellular and of a fibro-vascular system, entirely distinct from each other; the latter, forming what has been termed the skeleton of the leaf; the other, like the flesh in the human body, lying upon this skeleton, and filling up its interstices. The fibro-vascular system, composes what are called the veins, and sometimes, though very improperly, the nerves, of the leaf. The cellular system forms the fleshy part, or, as the botanists call it, the parenchyma of the leaf. The tubular vessels, and woody fibre, enter the leaf at its extremity nearest the stem, technically called its base, in a few distinct bundles; but soon after, these bundles divide and sub-divide, until at length, not more than two vessels are left together; one for conveying the sap, in its crude state, out from the stem; the other for returning it to the stem, after it has undergone certain changes in the leaves.

Leaves are arranged in classes by botanists, according to the manner in which the fibro-vascular system is disposed throughout the parenchyma. The principal of these classes are, 1st, that in which the bundles of fibres, after entering together, at the base of the leaf, diverge, and their subdivisions in no instance cross each other. Of this class the leaves of the red maple (*acer rubrum*) afford an example. Such leaves are said to be radiant-veined; and sometimes, fork-veined. 2d., that in which the primary veins diverge from the main vein, or mid-rib, like the plumes of a feather. Of this structure, the leaves of the chesnut and chinquapin (*castanea vesca* and *pumila*) are instances. Such leaves are called feather-veined leaves. 3d, that in which the several veins proceed without branching, from their origin at the base to their termination at the apex of the leaf. The veins, in such leaves, are connected by minute veinlets, passing at right angles from one to the other. The leaves of grasses belong to this class. Such leaves are called parallel veined leaves. On examination, it will be found that almost all leaves have their fibro-vascular system arranged in one of these three ways; and further, that the vast variety of form which we notice in the leaves of different plants, arises from the more or less abundant developement of the cellular system.

In order to make this matter plain, "we may conceive of a leaf, as formed by the protrusion of a portion of the medullary sheath of an exogen, or of one or more of the vascular bundles of an endogen, into the bark; which, at this early period, consists wholly of cellular tissure, invested by a cuticle. The continued extension of the fibrous portion pushes outwards the fold of soft bark in which it has insinuated itself; and at length the fibres diverge from each other, in a horizontal direction, and carrying the cellular system with them, produce the flat and dilated figure of the leaf."—This, however, it must be recollected, is not advanced as a true account of the manner in which a leaf is formed; but only as something which we may suppose to be true, for the purpose of tracing out the analogy existing between leaves, which at first sight would appear to have nothing in common.

Adopting this supposition, let us see how each leaf would be formed. We will commence with radiate-veined leaves. If the parenchyma is abundant, so as to fill up all the spaces between the veins, we have a rounded leaf, as in the *ranunculus abortivus*. Where the parenchyma is less abundant, we have a leaf, still rounded in its general shape, but lobed or toothed along its margin; as in the *ranunculus recurvatus*. Where the parenchyma is still less abundant, these indentations will extend nearly to the base of the leaf, and thus the palmate, or hand-shaped form of that organ, will be produced, as in the *ranunculus seleratus*. Where the parenchyma, is only sufficient to form a covering for the veins and sub-veins, we have the multifid or-many-parted form of the leaf; as in the *ranunculus fluviatalis*. Such a supposition as the one adopted, is not entirely gratuitous, for in many genera of plants, as in that of the *ranunculus*, or butter-cup, from which the above instances are taken, we notice all the intermediate forms, between an entire and a dissected leaf; indeed a large part of the series is often presented by the leaves of a single plant.

If we take the feather-veined leaf, and conceive the parenchyma to be so abundant, as to fill up all the spaces between the veins, we shall have an entire lance-shaped leaf, as in the peach, (*amygdalus persica.*) If the parenchyma is less abundant, we shall have a lobed or toothed lance-shaped leaf, as in the scrub-oak, (*quercus catesbaei,*) or in the beech, (*fagus sylvatica.*) If we conceive it to be sufficiently abundant, and so arranged, as to fill up the interstices between the secondary divisions of the vascular system, but not those between the primary, we have a compound leaf, in which the several leafets are arranged in lines, on both sides of the mid-rib, as in the yellow locust, (*robinia pseudacacia.*) If we conceive the interstices between the tertiary divisions of the vascular system to be filled with parenchyma, whilst those between the secondary and primary divisions are not, we have the decompound leaf, such as that of the honey-locust (*gleditshia triacanthos.*) Again, if we take a parallel-veined leaf, and conceive all the interstitial spaces between its veins to be filled up with parenchyma, we shall have the linear leaf, like those of grapes. If we conceive each vein to have only sufficient parenchyma to cover it, we shall have a leaf like that of the pitch pine (*pinus rigida.*)

Without pursuing this examination further, we will notice, that in every variety of leaf there is some part of the vascular system in contact with every part of the cellular system. The peculiar office of the first, is believed to be, that of conveying liquids to and from the latter; whilst the office of the latter is to elaborate the sap. The whole leaf may be compared to a manufacturing town; the veins being the streets, through which the raw materials are brought in, and the manufactured articles carried out; whilst the rows of cellules are the shops, in which the manufacture is effected. Such is the arrangement, that there is no street, which has not its row of shops, and no row of shops which have not their street.

If we examine the internal structure of the leaf more minutely, we will discover in every part of it, an admirable adaptation to the same end. The process termed elaboration, consists in the conversion of the crude sap into the different proximate principles, or "compound elements," of plants; such as sugar, resin, &c. This process, as has been already mentioned, is believed to be principally performed in the leaves. To its performance, the evaporation of water, and the absorption of gaseous matter from the atmosphere, appear to be indispensibly necessary. If with a powerful microscope, we examine a cross section of an apple leaf, we will notice, along the upper and lower surfaces, a thin transparent membrane; this is the cuticle, and envelopes the whole leaf. Immediately below this, there are three or four strata of spheroidal cellules, closely packed together, and so placed as to have their greatest diameter perpendicular to the surface of the leaf. Below these, and next the lower surface, we will see three or four more strata of cellules, very irregularly placed, and very loosely packed together. The upper part of the leaf has a compact structure; the lower, a cavernous one. And hence, in part, arises the deeper color of the upper surface. When we call to mind the fact, that it is the upper surface only which is exposed to the direct action of the sun, we will see, in the more compact arrangement of its cellules, a provision to prevent a too rapid evaporation of its liquids.

The cuticle, which covers the upper surface of the apple leaf, is nearly entire throughout; whilst that which covers the lower surface is pierced with numerous holes. Through these openings, the gaseous matter necessary for the sustenance of the plant, is absorbed; hence they have received the name of breathing pores. In consequence of its cavernous structure, the lower part of the leaf, presents a much larger cellular surface to operate upon the air, than the upper. In aquatic plants, whose leaves float upon the surface of the water, and of course have their under surfaces cut off from all communication with the atmosphere, the structure of the leaf is reversed. The breathing pores are all on the upper side. In grapes and other similar plants, whose leaves grow in a nearly perpendicular direction, thus exposing both surfaces alike, to the action of the sun and the atmosphere, the breathing pores are about as numerous on one side as on the other. That such is the fact, will be evident, from the following statement of their number, on the upper and lower sides respectively, of the leaves of several plants, as given by Prof. Lindley:

In one square inch of the	upper surface;	under do.
Hydrangea quercifolia, (hydrangea,)	none.	160,000
Peonia, (peony,)	"	13,790
Pyrus, (pear,)	"	24,000
Hypericum grandiflora, (St. John's wort,)	"	47,800
Arum dracontium, (water turnip,)	800	16,320
Alisma plantago, (water plantain,)	12,000	6,000
Iris germanica, (blue iris,)	11,572	11,572
Dianthus cariophyllus, (June pink,)	38,500	38,500
Tradescantia, (spider wort,)	2,000	2,000

The leaves of the four first mentioned of these plants, grow like those of the apple; those of the next two, lie partly upon the water; whilst those of the last three, grow like those of grapes.

In the arrangement of the fibro-vascular system of the leaf, we may notice an adaptation to the same end, as in the cellular. The vascular system, which pierces the parenchyma in every direction, consists of ducts and spiral vessels, surrounded by woody fibre. The use of the fibre is evidently to give strength and support to the parenchyma, and protection to the tubular vessels. The bundles are largest as they enter the leaf, and gradually diminish in size, towards the extremity of their ramifications, till they altogether lose themselves in the parenchyma. In this we notice a remarkable resemblance to the circulating system in animals. But are there separate sets of vessels for conveying the sap outwards, and for returning it again to the trunk? As I have already mentioned, there is believed to be. Not that we are able to demonstrate the fact by actual examination; for to the eye, even when aided by the most powerful microscopes, the smaller veins seem to be altogether single. But then "it is well known, that when a leaf has been macerated till the parenchyma is quite decayed, the veins will separate into an upper and lower stratum, so neatly and regularly, that it is impossible to doubt, their having originally consisted of two distinct systems, the one placed above the other. As the sap is propelled from the wood into the leaf in a crude state, and returned into the bark in an elaborated state, and as the veins are evidently connected with both the wood and the bark, it is inferred, that the upper of these layers is for the outward flow of the crude sap, and the lower layer for the backward flow of the elaborated sap." As we shall have occasion, when speaking of the food of plants, again to recur to the internal structure of the leaf, we will dismiss it for the present.

Leaves in their position on the stem, always observe some particular order of arrangement; and this order is uniform in the same species. The most common orders of arrangement are, that in which the leaves are placed alternately; and that in which they are placed opposite to each other. Respecting the first mode of arrangement, we may notice, that the leaves are seldom placed one above another, on exactly opposite points of the stem; but usually the second leaf is a little to the right or left of the point directly opposite the first; and in like manner the third, a little to the right or left of the point directly opposite to the second; so that tracing along the bases of the leaves of a branch, we describe a simple spiral. When the leaves are quite close, the spiral arrangement is very evident; when widely scattered it is less so, but yet may be discovered by close examination. In the apple tree the spire consists of five leaves; the sixth forms the commencement of a second series, and is placed directly above the first. This is the most common number in the spirals of alternate leaves. "The spiral arrangement of leaves is a beautiful provision for securing the symmetry of the branches; the wood being formed by the action of the leaves; if these were not placed in regular order over every part of the circumference, more wood would be deposited on some sides of the stem than on others. So when the spire is reduced to its simplest state, that of two leaves, or in other words, when the leaves are alternate, in the strict sense of the term, the stem is usually two-edged, or flattened from this very cause. In opposite-leaved plants, the pairs are placed in an alternate manner with respect to each other, that is, the second pair is at right-angles with the first, the third pair exactly over the first, and the fourth over the second. It results from this disposition, that the stems of opposite-leaved plants, are commonly more or less four-sided, instead of being cylyndrical, as in alternate leaved plants."

During that continual elevation of the sap of plants, which takes place in the cellules of the leaf, these is always more or less solid extraneous matter left behind. In the structure of the leaf, there is no provision made for getting rid of this. It of course accumulates in the cellules, clogs their vital action, and renders them stiff and hard. By the close of summer, the cellules become so much clogged, as to be unfit for the further performance of their functions. In the fall of the leaf, we see a wise provision of nature, for getting rid of such portions of the vegetable structure, as are no longer fit to fill their place in the economy of vegetable life. Hoary headed winter removes the worn out machinery, to make place for a new set, which the hand of spring shall supply. But how is the fall of the leaf brought about? It is generally said to be caused by its death. If this be the fact, why is it, that when a tree is killed during the summer, by lightning or some other violent means, the leaves instead of falling, remain attached to the stem until they actually rot off? The true explanation of the matter appears to be this. When the leaf and the stem are both growing, and in a healthy state, the base of the leaf and the branch which bears it, increase at the same rate, and there is no interruption to their mutual adaptation to each other. But when at length the full grown leaf looses its vigor, by the deposition of extraneous matter in its substance, and thus becomes rigid and unyielding, its base can no longer adopt itself to the growing stem. This happens at just the time at which the stem is growing most rapidly, from the deposition of wood beneath its bark. In this way, the union of the leaf with the stem is weakened, the connecting vessels are broken off, and so soon as the frost of autumn has finished the work, it is ready to fall before the first blast. This explanation accounts for the early fall of the lower leaves of herbaceous plants; and for the fall of the old leaves of ever-greens, at the time when the wood of the ensueing summer is being deposited. It also accounts for the fact, that the leaves of endogens, a class of stems which admit of no increase of diameter after they are once fairly formed, do not fall, but simply perish and decay upon the stem, as is witnessed in the leaves of corn and all grasses.

Leaves differ very much from each other in their size; some being nothing more than minute scales, in which you can hardly detect a distinct organization, without the aid of a microscope; and others 30 feet in circumference. "The leaves of the bujoor palm of India (*corypha elata,*) often measure 30 feet in circumference, and have a stalk to support them 12 feet long; so that if placed on the ground, one of these enormous leaves would be four times as high as a tall man. There is no machine of human invention, however extensive and complicated, which can for a moment be compared, with such a natural apparatus as this for wonderfully elaborate mechanism. Its digesting cells are infinitely more numerous than all the houses of London and its environs; and all the streets, alleys and passages of that huge metropolis, shrink into insignificance, when contrasted with the myriad ramifications of the veins of such a leaf."

(To be continued.)

REMARKS ON THE IMPROVEMENT OF LAND, BY LIME, &C. CULTIVATION OF CORN.

To the Editor of the Farmers' Register.

Fredericksburg, April 2nd, 1839.

Your April No. of the Farmers' Register has been read with pleasure, greatly enhanced by the valuable article of Commodore Jones. This gave me the more pleasure, as it was an example in proof of a fact which I had stated in an account current in the first No. of this volume of your work. In the name of *Stafford,* and the environs of Fredericksburg, I thank Com. Jones; and I sincerely hope his example may be profitably followed; not only by those holders of poor land I take the liberty of representing in Stafford, from my pre-eminence as the owner of the poorest; but by all in the poor old state of Virginia. I have been for some time gathering leaves, turf, and mould, from the woods and fence rows, on a piece of land destined for a truck patch. This vegetable matter, after being scattered, I intend to lime with about 70 bushels to the acre, and plaster with at least one, before turning in. I hope to make something from it this year, but shall calculate on a fine return next year, when all will have decomposed and become mixed with the soil. The result of this application I will acquaint your readers with in December, if I am then in the land of the living.

In corroboration of the article of Mr. Newton, and in direct contradiction of the statement he refutes, I can say, that in 1830, I limed 16⅜ acres of land with 100 hogsheads of shells, well burned, and applied according to the directions of F. Lewis, esq. of Weyoke—scattering the lime on the land after it was ploughed, and harrowing it both ways, the better to mix it. The crop of corn immediately following the application, was much better than on the adjoining lands, and all crops have continued to improve on it from that day to this. The land is of a darker and richer color, and is in every respect improved by the application of the lime. What will become of our marl if shell-lime is not valuable? I may state here, however, that I have invariably seen much greater effects, from the application of eocene marl, than from the experiment with lime spoken of above. Indeed, I have witnessed effects from this invaluable substance truly magical; and I hope to see the whole tide-water district of Virginia blossom as a rose, under its application, and your auspices.

This substance rests in a great quantity, entirely undisturbed, on the banks of the Rappahannock, while gold mines are sunk in the bowels of the earth, and the thoughts and hands of all the people, are engaged in counting multicaulis or bass buds, as the case may be.

From my experience in cultivating corn, on the light and truly corn lands in the tide-water district of Virginia, the culture so successfully pursued by Major Steger of Amelia, would not answer with them, unless where the land was extremely rich, so as to force the corn forward faster than the grass. On land making from four to five barrels per acre, I have invariably found it necessary to use cultivators, skimmers, or hoes, and more frequent ploughings, in order to keep under the grass until harvest; directly after which, it is generally the custom to run over the corn lightly for the last time. I would recommend the mode of culture spoken of by Mr. Hill in the third No. of the 7th volume of the Register, as much to be preferred to that of Major Steger, as mentioned in the same number by Wm. H. Harrison of Amelia, on all such lands as are usually found on our tide-water rivers. Very rich land, in good tilth, will make corn with almost no working at all; but inferior land, to make a good crop and a saving crop, requires judicious nursing. My experience in the Maryland corn, agrees with the statement of Mr. H. It will make more on rich land; on thin land it is very inferior to the more common productive sorts of corn in general use.

This hasty scrawl is really so unconnected and desultory, that I am at a loss to know what to do with it—whether to put it in the fire or trouble you with it; "in for a penny in for a pound," however. I will give you some further statements, and then let its fate be decided by yourself, hoping that you will not occupy valuable room in your paper with such stuff, unless you really deem it of some value.

Let me recommend root-culture to all my brother farmers. I have never had to regret any labor bestowed in this branch of husbandry, but have always reaped a full reward for it. More especially, let me recommend the Jerusalem artichoke, as a very valuable root for the feeding of hogs and cows, especially if well steamed or boiled with a little mixture of grain or meal of some sort. It is valuable because very productive; because very easy to cultivate; because sure to yield a crop in all seasons; because easily harvested, and because eaten greedily by swine and neat cattle, very much to the advantage of both.

In connection with a steamer, let me recommend two implements, by no means in general use. Green's straw-cutter, the very best machine I ever saw for cutting hay, straw or fodder; and an English malt-mill. I got one some years ago from Thomas A. Rust, of Richmond, and find it invaluable for chopping corn, peas, rye, &c. into a fine small hominy for feeding. It will make good meal, but then the labor is considerable; but one good hand will grind a quantity of fine hominy, or chop, in a *short time* and with *ease.* It is valuable any where, but on a large farm where there is a great deal of trash corn, wheat, peas, rye, &c. and at a place inconvenient to a mill, it is particularly so. The cost of each is about $30, and I think it is money well laid out, if they are carefully and judiciously used after they are procured.

With earnest wishes for the continued success of your Register, I am your

CONSTANT READER.

For the Farmers' Register.

EASTERN VIRGINIA.

We often see in our public prints, long speculations in the shape of Jeremiads, reciting all imaginable causes for the decline of our state, and bewailing, in most piteous terms, this sad catastrophe, as if the besom of destruction had literally swept the land.

It may be true that the state is declining, but the evil is greatly magnified by desponding; idle croakers who seem to take pleasure in vilifying and abusing the country, which ought to be as dear to them as life. With one voice, we will cry out, "is there no balm in Gilead!" but, when it is within our reach, we will not put forth a hand to receive it.

Our country is acknowledged, by all who have seen it, to be peculiarly rich in natural resources; yet what feeble efforts have been made to develope them! How must the proud son of Virginia blush when he visits the north, east and west of our vast confederation, and sees how our brethren have every where outstripped us in enterprise and improvement! He returns to his home; the high spirit which is yet born with every *gentle* son of our state, has been roused and excited by all he has seen; nothing goes on fast enough for him now; he is no longer satisfied to live in comparative idleness; he has not patience, or perhaps cannot afford, to follow the tardy course of a "liberal profession" in Virginia: the result is, that he goes off to a new country," where, if he can escape the perils of "flood and field," and the horrors of noisome pestilence, he may hope to acquire wealth enough to enable him to return and spend the evening of his days at the home of his youth, and rest his bones in his native soil. This hope is never realized; he becomes identified with his adopted land; soon learns the law of "hardest fend off," and is as thoroughly *dishumanized* as the veriest "hoosier" or "salt river roarer," about him.

It is thus that our finest young men are lost to the state. We must work a cure of this evil, and then, and not until then, will our "*Alma Mater*" recover her former glory. It must be a gradual process; we must teach our youth to give up the notion that law, medicine, and politics are the only "liberal" pursuits; and qualify them to enter the various channels for industry and enterprise which present themselves on all sides, and are left vacant because not thought sufficiently *respectable* for *gentlemen*. Above all, we must teach them by precept and example, that we can be sufficiently *respectable* as cultivators of the soil, even on a small scale, and that our soil is susceptible of great improvement.

A large portion of eastern Virginia is eminently adapted to agriculture. The lands, though very fertile when cleared, are generally very much exhausted by injudicious culture; they may, however, be readily restored by proper management, and rendered even more productive than they were when new. It was to be expected that the style of living and the wasteful system (or want of system) of farming practised throughout this country, would break down the overgrown estates which covered it: these estates have been cut up and divided for the most part, and the holders are beginning to discover by slow degrees, that their forefathers were not infallible adepts in the art of farming; they are now yielding reluctant assent, and some show of obedience to the excellent precepts of the Farmers' Register. The farmers are more generally out of debt than they have been for many years, as many of those who were involved have sold negroes at the late enormous prices, and freed themselves from their embarrassments. Such is the present condition of a country whose inhabitants have attained a high degree of moral cultivation, and have been distinguished for talent, kindness, and hospitality.

The present distressed condition of the whole union makes each state show out in her true colors, and is calculated to have a happy effect on our people, healing the blindness and infatuation with which they regarded the new states, checking emigration, making them better satisfied with home, and teaching them the difference between extravagance and generosity; so that there never has been, and never will be a better time for reforming our system of agriculture. Let us set to work to improve our lands, and let every thinking man inculcate upon all the young farmers whom he can influence, the homely virtues of industry and frugality.

Let us stop the drain of emigration, and learn our young men to work, and Virginia may yet shine forth a star of the first magnitude.

A RECLAIMED WANDERER.

From the Farmers' Cabinet.

A GOOD COW, GOOD BUTTER, AND A GOOD DEAL OF IT.

Mr. Editor,—As a good deal has been said relative to the quantity of butter exhibited some short time since, by Mr. Kenworthy, made from one week's milking of a single cow, I was curious to ascertain the facts, as well with regard to her *keep* as the produce. I accordingly inquired in the proper quarter, and was informed that the cow Filton, now about seven years old, was purchased of John Zane, of this county, with her dam, both for thirty-eight dollars. Filton, at the time of her purchase, was four months old. This is all the information I have been able to obtain. Mr. Kenworthy informed me that her keep was as follows: a small quantity of hay in the morning, then a mess of bran, while eating which she was milked, then about half a peck of grains, well mixed with a suitable portion of cut stuff, with the addition of a little salt. She was then *well curried*, then watered, and especial care taken that she did not drink too much. If the weather was favorable, she was permitted to run in the barn yard, if not, she was stabled again, and fed with hay only. At noon and night she was treated in the same way, as above described, in every particular, except that the grains were omitted at noon. Milked morning and evening, the quantity of milk varying from *twenty-two to twenty-eight quarts* per day. The following is the produce of butter from the two weeks' milking:

First week's butter - - -	18 lbs.
Second week's - - - -	16½
	34½

Three pans of milk, belonging to the second week's milking, were frozen, and thereby lost. The butter was very beautiful in appearance, and of a very superior quality, and we hope that many of our fair country-women will follow the example of Mrs. Kenworthy, who deserves no little credit for her care and attention to the duties of her dairy. J. M——E.

From the New England Farmer.

BOUNTY ON SILK IN MASSACHUSETTS.

The Secretary of State, by the direction of the house, has laid before the legislature the amount paid in the form of bounties, since the act of 11th April, 1836.

The returns embrace the names and residence of the claimants; the number of pounds of cocoons raised; the number of pounds of silk reeled; the number of pounds thrown; and the amount of bounty granted in each instance.

The highest quantity of cocoons raised is 615 lbs., and of silk reeled is 52 lbs. 8 oz. We will give the names of a few of the principal growers of silk.

	Cocoons raised.		Silk reeled and thrown.	
Ancory Holman, Bolton,	615 lbs.		52 lbs.	8 oz.
Benjamin Walker, Rehoboth,	277			
Timothy Smith, Amherst,	156		60	
Reuben Hoar, Littleton,	159	8 oz.		
Jonas Holland, Belshertown,	182			
J. Bodman, Williamstown,	182			
Roswell Rice, Charlemont,	97	8	19	
Joseph Field, do	76	8	16	4
Cyrus Smith, South Hadley,	70			
John Perry, Wales,	69		8	

And several others, whose names may be ascertained by a reference to the secretary's report.

We subjoin the aggregate for the four years:—

Aggregate.

Year when the warrants were drawn.	Pounds of Cocoons.	Pounds of Silk reeled.	Pounds of Silk thrown.	Total amount of bounty allowed.
1836	613.2	36.10	11.2	$85 20
1837	1001.8	109.1	65.11	187 51
1838	1854.15	149.9	140.9	350 52
March 6, 1839	2631	190.6	79.8	397 99
	6100.9	525.10	296.14	$1021 22

Secretary's Office, March 14, 1839.

This great interest is just in its infancy. As we have always believed and said, it is destined to be one of the great interests of the country; but we must wait patiently until the mulberry speculation has ceased, or at least abated, before much progress can be made in the raising of silk. Of the decline of the disease there is at present little prospect. A sale of mulberry trees the last week, has gone far beyond any which have been made before. We shall venture no predictions, but calmly wait the event.

A SUCCESSFUL MODE OF KEEPING SWEET POTATOES.

To the Editor of the Farmers' Register.

I see in the last number of the Register, an article from a correspondent, in which he speaks of the difficulty of keeping sweet potatoes. I can give him the plan of a house, which has kept potatoes for the last five years. At the usual time for digging potatoes, the old ones were to be removed to give place to the new. This is a plan of the house: dig a square pit in the ground about four feet deep, about the size you wish your house to be; log it upon the inside until the logs are about four or five feet above the surface of the earth; ram the dirt well around the log frame in the earth. On the outside of the first frame, build another frame of logs, leaving a space of one foot between the two; fill the space between the frames with sand or dry earth; upon the top of the frames lay a plank floor, and the upper part of the floor to be covered with earth about 4 inches deep, then a roof with the gable end open to the south, and closed at the north. Have a door in the log frame about two feet square, to the south. After the potatoes are dug they must be protected from the sides and bottom by dry pine leaves. The door must be kept open in warm dry days, and closed in cold damp weather, and always at night.

P. S. Also a floor to the potatoe-house of poles.

A SUBSCRIBER.

From the Farmer and Gardener.

SUGAR BEET FOR MILCH COWS.

An intelligent gentleman from the eastward, assured us a few days ago, that by giving his cows a peck of sugar-beet twice a day, cut up with their hay, he was enabled to get just as rich milk and butter during the winter, as in summer, when the pasture was at its best. Now as an acre of ground well manured, planted, in this root well attended, would yield beets enough to keep *ten cows* from the 1st of November till the 1st of May, should not every farmer make his arrangements for planting beets next spring? From our own experience, we have no doubt, that this addition of beets to the ordinary feed of the cows, would make a weekly difference of 2 lbs. each in their product of butter. From the 1st of November to the 1st of May, there are 26 weeks. This number of weeks at 2 lbs. additional butter, would give us 52 lbs. for each cow during the period named, or 520 lbs. for the 10 cows, and if we set down the butter as being worth 25 cents per lb., it will give us 130 dolls. as the value of additional yield brought about by the feeding with the product of an acre in beets. But this is not all,—the proprietor of the cows, in the spring, would have the gratification to know that he had treated his animals well, and the satisfaction of seeing them in good condition.

From the Southern Agriculturist.

CERTIFICATE OF THE PRODUCE OF ONE ACRE OF CORN; WITH OBSERVATIONS, BY AGRICOLA.

The undersigned, a committee of the Agricultural Society of Liberty County, Georgia, do hereby certify, that on the 15th of September last, they measured carefully, by a sealed measure, the product of corn raised by Doctor Wm. P. McConnell, from one acre of *manured* ground, which yielded eighty-three bushels, three pecks, and three quarts—for which, being the successful competitor, the society awarded him the premium of one hundred and fifty bushels of corn.

Wm. J. Way, } *Committee.*
E. W. Russel. }
Walthourville, *Oct.* 27, 1838.

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Messrs. Editors,—I send you the above certificate, signed by a committee of the Agricultural Society of Liberty County, from which you will perceive that we have turned our attention to the cultivation of corn, an article too long neglected, or deemed only a secondary interest by many of our planting friends on the seaboard, from the circumstance no doubt of their efforts being mainly directed to the culture of cotton. This policy, however, we find has proven illusive, an *ignis fatuus* that has led many of our respectable planters (to say the least) into a most unpleasant dilemma, especially during the two past years, when corn could scarcely be procured at any price.

There were fifteen gentlemen enrolled as competitors for the prize, several of them having made from fifty to seventy-three bushels to the acre. So far as I know, eighty-three bushels of corn has never been made before from the acre of ground in the lower parts either of Georgia or South-Carolina. Dr. McConnell's plantation lies on tide-water, and he selected for the experiment a piece of high-land, cleared perhaps before the revolution, and of course much worn, but for the last five or six years had been planted in cotton, and highly manured.

The corn (yellow gourd-seed) was planted the 10th of March, on beds about fourteen inches in width, seven feet from the middle of one bed to that of the other, two rows on each bed a foot apart, the stalks also a foot apart on the rows, and set in a *zigzag* form. This left a clear alley of six feet, and gave 12,600 stalks to the acre. The corn was ploughed twice and kept clean with a hoe. I will remark, that about the middle of June, the beds were entirely covered with oak leaves, to obviate effects of a drought should it happen, but the rains the latter part of that month, and first week in July made the corn. This is our first effort, next year I hope we may be able to make a better report still of our success. Planters generally, in the lower countries, I trust, will soon see their real interest in this matter, and learn practically to depend upon themselves for the staff of life. In conclusion, I would mention that the society awarded to Mr. Wm. Dunham the premium of seventy-five dollars as the most successful competitor (out of fifteen) for having raised forty-six bushels and a half of corn on an acre of ground in its natural state.

Agricola.

From the Genesee Farmer.

HAY-RACKS.

Hay-racks for feeding animals are best when placed in a vertical position, instead of inclining outwards, as in the former case, there is less liability of the hay being wasted, the heads of the animals will not become filled with hay-seed, and their breath will not ascend and render the hay offensive.

From the Southern Agriculturist.

POULTRY.

Mr. Editor,—It is much to be regretted that our market during the spring and summer months is so badly supplied with meats. Every where else these seasons are the best for the markets; but in Charleston, one can hardly get any thing palatable to eat.

This arises from our farmers not paying proper attention to their poultry. What is sent to market is so inferior as seldom to be fit to eat. What numbers of ducks, chickens, and turkeys might be raised for our market is beyond calculation. I have conversed with many of my neighbors, and they make complaints of the difficulty of raising these—but it appears to me that they mismanage in some way or other. Ducks, I scarcely ever fail to raise. The great secret in attending them, is to give them little water when young. These birds being aquatic in their natures, many persons will wonder at this. But such treatment invariably gives them colds; their wings soon begin to droop, and they die off in fits. My treatment of them I will here repeat to you, as given some years since.

Ducks, when just hatched, are always inclined to fever, from their pinion wings coming out too soon. This acts upon them as teething does on children. The young ducks should, consequently, be kept from every thing which may have a tendency to create cold in them. To prevent this, therefore, I always allow my young ducks as little water as possible. In fact, they should only have enough to allay their thirst, and should, on no account, be permitted to play in the water. If the person lives near the city, liver and lights should be procured; and these should be boiled and chopped up fine, and given to the young ducks. Or, if fish, crabs, oysters, or clams, can be procured, these should be given. In case none of these can be got, all the victuals should be boiled before feeding. Boiled potatoes mixed with hominy are also excellent. Half of the ducks which are lost, are, because raw food is given them. To sum up all in a word—if you wish to raise almost every duck that is hatched, give them little water, and feed them on no food which is not boiled. By observing this plan, I raise for market, and for my own table, between two and three hundred ducks every year.

Turkeys are also found difficult to raise with most persons. The following treatment will be found excellent: When the eggs hatch out, let the hen and chicks be confined in a garden, or any other place where the young ones can sun themselves. Let them be fed with hominy for two or three days; then carry them to a rail-pen, in a rye, oats, or buck-wheat patch; confine the hen, and feed at least three times a day with hominy or small grain. The young ones will soon run about catching insects, and will come to the hen's call. The hen should be thus confined until the turkeys are about *half-grown*; they will range about, but never without the sound of the mother's call. By this plan, we do away with the necessity of having a turkey-minder. The young ones are not so liable to injury from hawks or vermin as when they follow the hen in her rambles over the plantation, nor are they compelled, in keeping up with the hen, to fatigue themselves more than is good for health.

Great care must be taken to keep water out of the pen; it should be ditched all around, so as to keep it dry; its foundation should be made higher, with dry sand, than the level around, and the top should be well covered; the ditches nigh the pen should be covered with boards, to keep the young ones from falling in. You may rely on this plan, Mr. Editor. I have seen out of eighty-seven turkeys, eighty-six raised,—one having been mashed by a horse.

From the Southern Agriculturist.

CULTIVATION OF WATER-MELONS.

This delicious melon may be cultivated for an early market in the following manner:

Select a high and dry soil for the purpose. Plough it up well, and harrow it. Check off the spot thus treated at distances of ten feet each way. Dig out each check with a hoe or spade, and into the same place five or six quarts of cotton seed; or if this cannot be procured, fill the same with stable manure, partly decomposed. Haul over this the earth before dug from the hole, and mix it well with the manure. If you have used cotton seed, in the spring, it will have sprouted a week or two after being put into the hole; and must now be killed by chopping up the same well, and mixing it with the soil. This being done, you may now haul up the manure and earth as before directed, into hills; on the top of which you must place about a peck of sand taken from some street or well travelled road. Your hills will be now ready for planting. I should however, state that the hills must, instead of being made high, be made flat and broad.

Soak your seed over night in milk warm water, and plant out the same the next morning, placing from five to six seed to each hill. The seed must not be covered more than one inch or two under ground. Water the hills for a few days until the seed has sprouted, and then leave the plants to run.

As soon as the plant has got six leaves, take off the centre plant with a sharp penknife, and when the lateral shoots are six inches or a foot long, take off all but three. When the shoots, thus left, begin to run to the ground between the hills, stake them down with a small cross stick.

As the vines begin to branch, at every three or four feet, where the vine branches, put a shovel full of rich earth over the same, and press it down lightly with the foot. Wet weather should be selected for this operation, and by so doing the vines will never fail to take where they have been set. The spaces between the hills should be kept free of grass--and by following the above directions, large and fine melons will be produced.

From a quarter acre of land thus treated, more melons will be made than from four times the amount as usually cultivated.

From the Journal of the American Silk Society.

MEMORANDA FOR YOUNG SILK CULTURISTS.

Let silk cultivators bear in mind, that the careful and attentive manager of silk-worms, will make his worms spin cocoons in four weeks; eight pounds of his cocoons will make a pound of raw silk, and a pound and a quarter of his raw silk will make a pound of finished sewing or other silk. The careless manager will require at least six weeks before his worms spin their cocoons, ten pounds at least of his cocoons will be required to make a pound of raw silk; and at least a pound and six ounces of his raw silk will be required to make a pound of finished sewing silk. Let the rules of arithmetic be applied to find how well the silk business will pay for care and attention!

G. B. S.

From Loudon's Gardener's Magazine.

ON THE CULTIVATION OF MADIA SATIVA, AS AN OIL PLANT.

By W. Hertz, Nurseryman and Seedsman, Stuttgard.

M. Bosch, superintendent of the gardens of the king of Wirtemburg, has made numerous experiments for many years on acclimatising exotic plants, during the course of which one plant, *Madia sativa*, attracted peculiar attention, as he found from the reports of travellers in Chile, that it is cultivated in that country as an oleiferous plant, and an excellent oil is extracted from it. During the last few years, M. Bosch has given this plant a fair trial on a large scale, at considerable expense; and the results of this trial have surpassed his most sanguine expectations.

The plant is an annual belonging to the natural order *compositæ*, attaining the heigth of from 1½ ft. to 2 ft.; it agrees with every rotation of crops, and succeeds in all soils, provided they are neither too humid nor too stiff and binding; but, in a rich soil, if the necessary space be given to the plant to spread out its branches, it attains the highest perfection. The proper season for sowing is either in October, or the spring, and the necessary quantity of seeds required for an acre depends upon the condition of the soil, and varies from 4 lb. to 6 lb.; but it is, of course, advisable to sow a little more than is actually wanted, to provide against any unforeseen accidents which may happen to the seeds before germination. The young plants are not damaged by spring frosts; nor are they liable to be attacked by animals or insects. If spring sowing be preferred, the ground must be well prepared in the autumn, in order to sow the seeds as early in the spring as possible; after which they must be pressed down by rolling, and will need no other culture than to be kept free from weeds. When the seeds begin to ripen, which may be easily known by the change of their color from green to black, the plants are either cut off near the ground, or pulled up by the roots, and laid on the ground for drying; after which they are treated like rape. The seeds however, must not remain long before they are thrashed out; because the glutinous stalks, when heaped up, soon begin to ferment, and will do the greatest damage to the seeds.

The produce of one Wirtemburg acre, containing 38,400 square feet, amounts, according to the nature of the soil and the condition of the plants, to from 4 to 6½ scheffel (bushels) of seed. One scheffel weighs from 194 lb. to 208 lb.; and from that quantity from 68 lb. to 70 lb. of oil have been obtained, according to the trials that were made in several mills of different constructions.

According to a chemical analysis, 100 parts of the Madia oil consist of 45 parts of oleine (or fluid part of the oil), 40 of stearine (the mucilage, or fatty part), and 15 of glycerine (or sweet solid part, a honey-like and glutinous substance). This oil does not congeal at below 19° Reaumur, but only becomes a little less fluid, which makes it an incomparable substance for keeping all sorts of machines in order; and there can likewise be a solid and well lathering soap made of it. That it may be advantageously used in cloth manufactories has been proved by experiments already made, by which it was found preferable to the olive oil, which had been previously used. The produce of this annual oil-plant, if compared with that of the rape and the poppy, leads to the following conclusions:

The rape, which attains its perfection only in the second year, produces from 4 to 5 scheffel of seed per acre, and but seldom succeeds well. One scheffel of rape-seed gives 96 lb. of oil; therefore, one acre, in the space of two years, produces 480 lb. of oil, which makes for one year 240 lb.

One acre sown with poppies gives from 2½ to 3 scheffel of seed; from one of which are obtained 88 lb. of oil, which gives a produce of 264 lb. per acre yearly.

One acre cultivated with *Madia sativa*, which ripens generally towards the end of July, produces from 4 to 6½ scheffel of seed. One scheffel gives 68 lb. of oil, therefore 6½ scheffel make a produce of 442 lb. of oil.

For all these reasons, it is to be hoped that the *Madia sativa* will soon take that place in our agriculture, to which, by its usefulness, it is justly entitled; and which, also, our sovereign (the king of Witemburg) has already acknowledged, by rewarding with a gold medal the merit of M. Bosch, in introducing a plant into field-culture which promises to become uncommonly useful, not only to our agriculture, but to our manufactures and trades. To make this important article as general as possible, I have a quantity of its seed for sale; and, for the convenience of the English agriculturist, I have made an offer to Mr. Charlwood to undertake the sale of it in England.

Stuttgard, Dec. 30, 1838.

From Young's Agricultural Travels in France.

FISH-PONDS IN FRANCE.

Sologne.—This province abounds very much with ponds of all sizes, which let at from 5 *liv.* to 12 *liv.* the arpent.

Bourbonnois.—*Moulins.*—Through every part of this province, which I saw in crossing it in two directions, the number of fish-ponds is very considerable. The country, though in extensive views flat to the eye, is, on a nearer examination, found to swell into a variety of gentle inequalities, which form valleys, with small brooks, springs, or streams, in them, as eligible for a residence, and agreeable to the eye, as it would be beneficial to cultivation, if they knew how to apply them. Mounds are made across these little vales, to form ponds; and there are mills at their heads, when the streams are considerable enough. These ponds are from two or three to ten, twenty, and thirty acres, and some a great deal more. They are all fished regularly every second or third year, and the fish sold, at so much a thousand, to the merchants, who send them, by the Allier, Loire, canal of Briare, and Seine, to Paris. On one estate, I saw eight ponds, that paid 800 *liv.*; on another, four paid 800 *liv.*; and, on a farm of about 400 acres, four ponds paid 1000 *liv.* Water deceives one so much in guessing the superficies, that I may be erroneous (for nothing is measured in this province); but I should guess, that land under water paid 20 *liv.* an acre at least, instead of 3 *liv.* which is the more common net produce of the country; and, at the same time that the proprietor receives this superior benefit, his table is, by the terms of the contract with the merchant, who stocks the ponds himself, allowed to be amply supplied.

Bresse.—The ponds of this little province and Dombes, cover 66 leagues square of country, and are found terrible to population, from the effect they have on the climate.* In 1764, ponds in France generally let at 5 *liv.* to 7 *liv.* per arpent.†

The management of ponds is vastly better understood in France than it is in England, both as to stocking, adapting the sort of fish to the soil, clearing the ponds, emptying, fishing, &c. &c. In all catholic countries, fish is of more importance than in protestant ones, and this occasions more attention being paid to them.

From Notes on the Agriculture of Lombardy.

EXAMPLE OF THE HOARDING SYSTEM, SUBSTITUTED FOR THE BORROWING SYSTEM OF GOVERNMENTS.

In an age in which the sovereigns of Europe are incumbered, and some of them ruined, by debts, a contrary conduct deserves considerable attention. The Duke of Modena, for ten years past, has practised a very wise economy: he is supposed, on good authority, to have saved about a million of *zecchins*, (475,000l.) and he continues to save in the same proportion. This is a very singular circumstance, and the effect of it is observable; for I was assured at Modena, that this treasure was much greater than the whole circulating currency of the duchy; and they spoke of it as a very mischievous thing, to withdraw from circulation and *use*, so considerable a sum, occasioning prices generally to rise, and every thing to be dear. By repeated inquiries, I found this dearness was nothing more than what is found in the states around, which have all experienced, more or less, a considerable rise of prices in ten years. But how could withdrawing money from circulation raise prices? It ought, on the contrary, in a country that has no paper-money, to lower them. That this effect did not follow, we may easily conclude, from these complaints. But the very persons who complained of this treasure could not assert that money was more wanted in the duchy than before it was begun to be saved. They even gave a proof to the contrary, by affirming the rate of interest to be at present 4½ per cent. only. Upon the whole, the effect is evidently harmless; and it is a most curious fact in politics, that a government can gradually draw from circulation a sum that in ten years exceeded the current coin of the state, without causing an apparent deficiency in the currency, or any inconveniency whatever. Conclusions of infinite importance are to be drawn from such a fact; it seems to prove, that the general modern policy of contracting public debts, is absurd and ruinous in the extreme; as saving, in the time of peace, is clearly without any of those inconveniences which were once supposed to attend it; and by means of forming a treasure, a nation doubles her nominal wealth, that sort of wealth, which is real or imaginary, according to the use that is made of it. The reputation, preventing attacks, is perhaps the greatest of all. How contrary to the funding system, which carries in its nature, such a probability of present weakness, and such a certainty of future ruin!

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* *Observ. sur L'Agricult. par Mons. Varenne de Fenille*, p. 270.

† *Chanvalon Manuel des Champs.* 12mo. P. 363.

From Young's Agricultural Tour in Spain.

IRRIGATION IN SPAIN.

The prospects down the vale of Aran beautiful; it is without fallows, fine hemp instead of them. Look down on the town of Esteredano, around which, culture rises pretty high up the mountains. All the corn cut, is reaped, and bound in sheaves —walnuts. Descend into the vale—figs. Watered meadows. Ray-grass predominates; much common clover, white clover, trefoil, vetches, &c. A causeway for irrigation across the vale; the meadows are uncut, and have two and a half tons per acre, on an average; the corn all through, three-quarters an acre. Pass a rich flat common; part of this vale fed by horses, mules, hogs, asses, and a few oxen.

Advancing—what meadows there are, are well watered; as are French beans, hemp, and a small quantity of lucerne.

Leave Poeblar; they have lucerne, but not good; the gardens are all watered; mulberries; prices of silk this year, 18 *liv.* the pound. Cultivation all around, among the olive trees; but it is corn one year, and fallow another. Cross the river, which is here sixty yards wide. Wheels for raising the water of it into the gardens, ten or twelve feet high; they are of a very simple construction; something like the common water-wheels of a mill, but made very light; the fellies of the wheel are hollow in divisions, taking the water in through holes at equal distances, and as the stream turns the wheel, it delivers the water out of the same holes at the top of its revolution, into a trough, which conducts it where wanted; it is cheap, simple, and effectual. Many peach-trees scattered about the gardens, &c. Mount the hills; pass two large tracts, of above one hundred acres, destroyed by the torrents. Great quantity of pudding-stones. The mountains around are of interesting and bold features. The country in general here has a great mixture of cultivation and waste; it is for some space pleasing enough to the eye, but the produce is, I believe, very low; we saw many oats, and scarcely any that will produce more than a quarter an acre. They have no meadows; and I should observe, that our mules have not found such a thing as hay; straw and barley are their food; in all those spots which would give grass, corn and legumes are sown, as more necessary and more valuable; and this, I am told, is the case over all Spain, lucerne excepted.

Near Monte Schia—they have here poor crops of flat barley: of water, they know well the value, a spring of any account being carefully conducted into a reservoir, and let out at seven in the morning and at night to water.

Advancing—there is some good hemp, watered; and I see enough of the country to find that water is all in all; where that is to be conducted, they get crops that pay well; but where no water, they have not the power or the knowledge to turn the soil, however good it may be, to a profitable account; fallow the only effort, and the success every where miserable.

Cross a fine stream with many acres under it, yet no watering; the reason I cannot tell, unless the land is common; if so, it is easily explained.

The soil stoney; the large, of the pudding class; but, in the midst of this arid wretched desert, come to a spring, which rises out of the earth into a small reservoir, and is immediately used for irrigation; maize, hemp, cabbages, beans, and all fine; the contrast shows the astonishing effect of water, and that in this climate, the soil is the least object—the sun and water do the whole.

Passing Paous; every thing changes the features; the vale, on comparison with those we have seen, is wide, and also flat, and water plentifully conducted in canals, which pass every quarter, so as to let into the field of every proprietor; having passed above one hundred miles of dreary mountain, this vale, so great was the contrast, had the appearance of enchantment; the care and attention given to irrigation, cannot be exceeded. The land is prepared for it, by levelling with a nicety as curious as for making a bowling-green, and this (conducting the water excepted, which is common to every one), is the only expense: this general level is divided into oblong beds, from six to eight feet wide, by little ridges of fine mould, drawn up nicely with a rake every time the ground is sown, in order that the water may not spread over too much at once, in which case, the irrigation would be unequal; there would be too much of a current at the part where the water enters, a circumstance of no great importance in watering grass-land, but which would be mischievous in arable; small trenches take the water from the carrier canals, and passing by the ends of those beds, the farmer opens them at pleasure, to distribute the water where wanted. As soon as the land is sown, it is watered, and periodically, till the plants are up; moderately while they are young; but every day, and sometimes twice a day, when full grown: the effect is surprising, and infinitely exceeds that of the very richest manures that can be spread upon any land. The rapidity of vegetation is so great, that there are but few crops, which demand all the summer for coming to perfection; I believe hemp is the only one; that plant is now five to seven feet in height, and of so thick a luxuriance, that nothing can be imagined finer. The rye stubbles are ploughed and sown with French beans, which are up and watered. After hemp, wheat is the crop.

Watered maize here, seven to nine feet high. Every time we see any irrigation, we are struck more and more with the importance of water, even on soils which are apparently mere rock, and on the most arid deserts, it gives at once the utmost luxuriance of vegetation. Vines and olives, however, stand in no need of it, but thrive admirably on the driest soils without it: not one acre, however, in twenty, is planted with them that might be.

Come to more watered grounds; gardening and husbandry mixed; peaches; apples; ripe pears; pomegranates in the hedges, as large now as walnuts in the shell; onions and lettuces in great plenty. Some watered lands have been sold at 1300 *liv.* the journal.

Near Martorelle is a fine irrigated valley; French beans, seven feet high. Good lucerne, cut three or four times a year; onions, cabbages, and lettuces; but the hemp, every where a principal crop, not great. The land all formed into beds for watering, which I have already described.

Exceeding fine hemp, watered. Maize thick, and in ear. Many fine and tall poplars by the river.

They are now (July) ploughing their stubbles for French beans. Their course is,

1. Hemp.
2. Wheat; and after wheat, French beans.

Three crops are therefore gained in two years. The products good. Very fine mulberries. A journal, which is here also about an English acre, of rich land in the vale, not watered, sells for 500 *liv.*: watered, for 1000 *liv.*

Leaving Barcelona, enter immediately an extraordinary scene of watered cultivation, and which must have given the general reputation to the province. Nothing can well be finer. The crops in perpetual succession—and the attention given to their culture great. Not the idea of a fallow; but the moment one crop is off, some other immediately sown. A great deal of lucerne, which is cut four, five, six, and even seven times in a year; all broadcast, and exceedingly thick and fine, from two and a half to three feet high, when cut. It is all watered every eight days. We meet many mule-loads of it going into the town, each 450 lb. or 4½ quintals, which sells for 4 *pefettos*, or near 4*s*. English; suppose it 4*s*. for 500 lb. it will not be difficult to calculate the produce of an acre. All I saw would yield 10 tons, green, per acre, at each cutting, and much of it a great deal more; let us suppose five cuttings, or 50 tons per acre, at 16*s*. a ton, this is 40l. sterling per acre. It is to be remembered, that the growth we saw, was the third, perhaps the fourth, and that the first and second are in all probability more considerable, it will not, therefore, be thought any exaggeration to calculate on five such. I by no means assert that lucerne yields always, or generally so, as I speak only of what I see. I have very little doubt, however, but this is the amount of that portion, which is thus cut and sold to Barcelona; possibly one-third, certainly one-fourth, is to be deducted for the expense of carriage; this is the most difficult part of the calculation, for it depends on how many times the mule goes in a day, which must also depend on the readiness of sale, and other circumstances. The profit is, however, amazingly great. All the other lucerne I have any where seen sinks, in my idea, to nothing, on comparison with the vast and luxuriant burthens given by these watered grounds. The finest crops I have known in England, are drilled; but there is a fallacy to the eye in the drilled crops, in proportion to the distance of the rows; they appear thick while they are really thin, but in broadcast ones, which satisfy the eye, there is no deception; and these immense burthens, through which the scythe is with difficulty moved, produce more at one cutting, than two-feet drills would at three, with the advantage of the herbage being finer and softer. But weeds in England and Catalonia are two very different things; it well deserves, however, with us, a better trial than it has yet generally received; I have viewed broadcast crops; particularly Rocque's, on a very rich garden soil; and Dr. Tanner's, on a common turnip loam, which, though not to be named with the Spanish, were certainly encouraging.

Hemp, through all these watered lands, is the predominant crop; it is seven feet high, and perfectly fine; some of it is already harvested. I am sorry to see that the watered part of the vale is not more than a mile broad. Indian fig, called here, *figua de maura*, grows six or seven feet high, very branching and crooked, the arms at bottom as thick as the thigh of a common man; those and many aloes in the hedges. Every garden or farm has a small house, with a reservoir for water, which is filled in most by a water wheel, with jars around the circumference. The gardens between Barcelona and the fort, and also within the walls, are watered in the same manner; the water is let into every little bed, in the same way as I have already described. They are crowded with crops, and kept in most beautiful order; those in and close to the town, scattered with mulberry trees. But in the district of which I am speaking at present, among the hemp and lucerne, neither vine, olive, nor mulberry. These watered lands belong generally to proprietors who live in Barcelona, and are let at 30 to 40 Spanish *livres* the journal.

The valley, in its widest part, is three miles broad. Here it lets at 34 Spanish *livres* a year the journal, and sells from 600 *liv.* to 1000 *liv.*; each of these *livres* being about 54*s*.: (1000 Spanish *livres* makes 2700 French ones). Taking the medium, or 800 *liv.* and the French *livre* at 10½*d*., this makes the price of a journal 90*l*. 2*s*. 6*d*.; and the rent of it 4*l*. The gross rent of the land, therefore, pays nearly 4½ per cent.; but whether this is clear rent, the tenant paying all taxes, and doing the small repairs of his house, &c., or whether there are deductions on these accounts, are questions which were neither forgotten nor resolved. To show the quick succession of their crops, they have corn in stooks on the borders of some of the fields, and the land ploughed and sown with millet, which is already nine inches high. Many bleaching grounds.

Advancing—the irrigated land lets from 24 to 40 Spanish *livres*: that not irrigated, at 15 *liv.* Water, therefore, here more than doubles the rent of the land; and in other places, we have found the difference yet greater. The soil all the way a red and brown deep friable loam, with a sufficient adhesion for any crops. They sow French beans after hemp, and then sow wheat.

At Ballalo, two hours from Barcelona, we meet with the first vineyards, but the hills here come down to the sea; and where they do not, the vale is not more than half a mile wide. Lycium in the hedges; some few mulberry trees. Oranges in the gardens; a few palm-trees, with vines around them.

A journal of watered hemp, produces from 10 to 12 quintals; if not watered, the product much inferior; the price, 14 to 17 Spanish *livres* the quintal, or 35s. English, which makes 19*l.* 5*s.* an acre. This is, however, to be understood of a very fine acre. The mountains are at half a mile distant, and partly cultivated to the top. All the way inclosed, and the men mending gaps in their hedges.

Every scrap of flat land well watered, from wells and reservoirs; the hill covered with vines.

Land, near Canet, well watered, sells for 500 Spanish *livres* the journal; vineyards for 300 *liv.* They give, in good years, to 12 charges. Unwatered land, 100 to 150 *liv.*

Enter a flat vale, half a mile broad, not watered. Hemp, very poor; maize, seven feet high. Vineyards, under regular plantations of olives; corn cut, in stooks, and the land ploughed. A journal sells for 200 *liv.* and further on, where irrigated, for 1000 *liv.* which is an astonishing difference.

While the mountains and waste parts of the province present an unfavorable prospect, the watered districts are, on the contrary, scenes of most exuberant fertility. To a person, from the north of Europe, there can hardly be a more striking spectacle than the effect of watering in these southern climates; it converts an arid stony waste, which would yield nothing but vines and olives, and on which every sort of grain would hardly return the seed, at once into fields pregnant with the richest harvests; on such soils, it gives almost the whole value of the land; and on the richest, it raises it, at the least, double; and, in some instances, five times. It enables the cultivator to have a succession of crops, more important than any thing we know in the north. The reaping one crop is but the signal for immediately putting in another; in doing which, they exert themselves with the utmost activity; ploughing universally as soon as the corn is cut; and are, by this means, enabled to have constantly two crops a year. The extreme fertility of these lands has, however, led many travellers into great or ignorant exaggerations; they have asserted, that the land yields many crops at the same time, one under another, which is both true and false. It is fact, that corn, wine, oil, and silk, are produced by the same field, in some few instances; but it is not from hence to be concluded, that the goodness of the land, or the importance of irrigation, is at all shown by that circumstance. The fact is, that it is impossible to raise one crop under another, without losing in one nearly as much as you gain in the other; the olive, being a large tree, cultivation may be carried on under it, but the crop gained is poor, and shows, that exactly in proportion to the shade is the injury sustained by the produce which is shaded. If the trees are thick, the corn is hardly worth reaping; it is the same in other cases, and I was well convinced, from viewing their grounds with this design, that the soil can carry, profitably, but one crop at a time; several may be crowded on it, but nothing is gained; with grass under trees, this is not the case so much in a hot climate; but even grass is damaged, and it is not the question, at present, as they have none. A country to be supported, and in a hot climate, without meadows or pastures, sounds very strange to English ears, and it is among the curious circumstances of this part, and I am told of the rest of Spain. If they applied to grass the land that is proper for it, they could not possibly have bread to eat; straw here is given instead of hay, and entirely supplies its place; and the oxen and mules, which we saw, did not show in the least, by their looks, any deficiency in nourishment. Lucerne is not at all common through the interior part of the province, and where they cultivate it, it is used green. Maize is sometimes sown merely for its herbage, as it might be, I believe, profitably in England, late in the spring, to avoid our frosts; it is one of the most nourishing plants in the world.

The consequence of water being so apparent in the province, I could not but attend particularly to their exertions in conducting it, and I concluded, that not one acre in twenty, perhaps in forty, is watered, that might be. In the flat vales, where canals of irrigation are made, at a small expense, a very good, though by no means a complete, use is made of them; but on the declivities of the mountains, it is necessary to erect a mound of solid masonry across the river, and to cut the canal partly out of rocks, and to support it by walls of stone, as I have seen in France; and having thus diverted a large portion of the water of a river, to carry it on its level, along the side of the mountain, as far as it will go; such exertions demand a much greater capital, than is to be found upon the lands of Catalonia: it could be done only by a great lord, who knew the importance of such undertakings, who resided on his estate, and whose income was spent in something else than the taste and pleasures of a capital. But leaving such exertions to individuals, who either have not the money, or not the will to employ it, is to perpetuate wastes. It is the king only who can make those efforts; a monarch, who should be determined to improve his kingdom, would presently find the means of doing it. The importance of water is so well known, that if a canal is made to conduct it, the proprietors, or farmers of the lands below, would readily and speedily make use of it, paying proportionably for the quantity they took; this is the system in Lombardy, and the effect is great. It would be the same in Catalonia, but the capital, for the great work of the canal, must probably be supplied by the king, if not the whole, at least a considerable portion. Such money should be lent to undertakers, at a moderate interest. Exertions of such a nature, with a proper general attention given to these objects, would make them fashionable among the great lords of the kingdom, and fertile provinces would soon be created out of barren and desolate wastes. Arbitrary power has been exerted for ages, in efforts of barbarity, ignorance, and tyranny; it is time to see it employed in works that have the good of mankind for their aim. A beginning, and a very good one, is made in the construction of some great roads, on a scale of true magnificence, which is never exhibited with such effect as in works of public utility; and whenever the importance of cultivation is well understood in Spain, and the right means of advancing it clearly analyzed, irrigation will then receive an attention that has not, hitherto, been given. Such is the necessity of water, for various productions in this climate, that rivers ought to be no more than infinitely multiplied channels, and collected in one stream only, as a reservoir for fresh, and repeated deviations.

For the Farmers' Register.

THE COUNTY OF FLUVANNA.

We have experienced in this region quite a hard winter, though very little snow has fallen. Nevertheless, I think, with exception of late sowing, in consequence of a continued wet season, our wheat generally promises well. Two very severe frosts within this month caused considerable apprehension for the fate of young clover, tobacco plants, and fruit, but they all passed unscathed. The two first are hard to be killed, and fruit was luckily too backward to be much endangered. Those who had planted morus multicaulis have entertained fears for its safety, but I fancy, without grounds. ——————— brilliant success in that culture, together with the inestimable testimonials of its profits, as set forth in yours and most of the journals of the time, have infected our neighborhood with the *rage;* and a respectable company has been organized for the propagation of the tree, (of which I am an humble member,) under the style and title of the "Palmyra morus multicaulis company." I fear the fever has seized on us rather *late in the day*, as well as season, both for the chance of great profit, as of success in the plantation, as the cuttings for our experiment are yet to be planted. But a suitable piece of ground having been laid out and well prepared, under the superintendance of our zealous and industrious president, Dr. Blakey, a resident of Palmyra, we have much to hope. By the way, as you have doubtless partaken of the false impression common to the country in which we both live—and indeed hardly confined to it—that *Fluvanna* is another term for sterility of soil, poverty of purse, and all that is barbarous in arts and taste—let me tell you, that Palmyra, the metropolis of the county, is a handsome and flourishing little village, situated on elevated, but rather broken ground, for convenience; overlooking the Rivanna, over which there is a handsome and substantial covered bridge, just below which are mills of various kinds; among them a large manufactory of flour, with another of wool, and one of plaster attached; not forgetting saw-mills, and last, though not least by any means, a new establishment with all the necessary apparatus, (in view on a creek within half a mile,) for crushing *gold* ore, of which there is a quantity at the door awaiting the separation of the *precious metal* from the baser ore which envelopes it. "Prodigious!" you will say. But this is not all—Palmyra is adorned by one of the handsomest and most commodious court-houses in the state, with tasty offices appertaining; a large tavern and dwelling house convenient, of brick; besides store houses and shops of every kind, whose tenants are mechanics of higher qualifications and character than are usually to be found in a village. The dwelling houses of the inhabitants that are not of brick, are well built frame houses, painted white, which give an air of variety and neatness to the village; and as if to "lend enchantment to the view," the far extended chain of Southwest Mountains presents itself to the eye, and beyond it in the distance, the more grand and lofty Blue Ridge. To crown all—this flourishing little place has sprung into renewed existance under the auspices and late proprietorship of the Messrs. A. & A. Shepherd, to whose enterprise, intelligence and highly estimable characters, the community around is deeply indebted. As to the fertility of the county—whose ill name has been given it by travellers over its barren ridge roads—it is only necessary to call your attention to its geography, in reference particularly to the extent of it through which the James and Rivanna rivers, and their innumerable tributary creeks, pass. Go to the manufacturers of tobacco in Richmond and ask them what county in the state affords the highest priced and best tobacco, and *most of it* too? They will tell you Fluvanna. But my dear sir, you must come among us to see and acknowledge the injustice of aspersions which have for an age rested on the hitherto despised "state of Fluvanna."

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From Anderson's Essays.

ON THE MANAGEMENT OF THE DAIRY, PARTICULARLY WITH RESPECT TO THE MAKING AND CURING OF BUTTER.

By Dr. James Anderson.

When a dairy is established, the undertaker may sometimes think it his interest to obtain the greatest possible *quantity* of produce; sometimes it may be more beneficial for him to have it of the *finest quality*, and at other times it may be necessary to have both these objects in view, the one or the other in greater or less proportion; it is therefore of importance that he should know how he may accomplish the one or the other of these purposes, in the easiest and most direct manner.

To be able to convert his milk to the highest possible profit in every case, he ought to be fully acquainted with every circumstance respecting the manufacture both of butter and of cheese; as it may in some cases happen that a certain portion of that milk may be more advantageously converted into butter than into cheese, while another portion of it would return more profit if made into cheese. It is not, however, intended in the present essay to enter into this wide discussion. Here, it is only proposed to treat of the manufacture of butter, leaving the subject of cheese-making to some other person to treat of, who is more conversant in that department than the author of this essay.

The first thing to be adverted to in an undertaking of this nature is, to choose cows of a proper sort. Among this class of animals, it is found by experience, that some kinds give milk of a much thicker consistence, and richer quality, than others; nor is this richness of *quality* necessarily connected with the smallness of the *quantity* yielded by cows of nearly an equal size; it therefore behoves the owner of a dairy to be particularly attentive to this circumstance. In judging of the value of a cow, it ought rather to be the quantity than the quality of the *cream* produced from the milk of a cow in a given time, than the quantity of the milk itself. This is a circumstance that will be shown in the future to be of more importance than is generally imagined. The small cows of the Alderney breed afford the richest milk hitherto known; but individual cows in every country may be found, by a careful selection, that afford much thicker milk than others; these, therefore, ought to be searched for with care, and their breed reared with attention, as being peculiarly valuable.

Few persons who have had any experience at all in the dairy way, can be ignorant, however, that in comparing the milk of two cows, to judge of their respective qualities, particular attention must be paid to the time that has elapsed since their calving; for the milk of the same cow is always thinner soon after calving, than it is afterwards; as it gradually becomes thicker, though generally less in quantity, in proportion to the time the cow has calved. The color of the milk, however, soon after calving, is richer than it afterwards becomes; but this, especially for the first two weeks, is a faulty color, that ought not to be coveted.

To make the cows give abundance of milk, and of a good quality, they must at all times have plenty of food. Grass is the best food yet known for this purpose; and that kind of grass which springs up spontaneously on rich dry soils is the best of all.* If the temperature of the climate be such as to permit the cows to graze at ease throughout the day, they should be suffered to range on such pastures at freedom; but if the cows are so much incommoded by the heat as to be prevented from eating through the day, they ought, in that case, to be taken into the cool shades for protection, where, after allowing them a proper time to ruminate, they should be supplied with abundance of green food, fresh cut for the purpose, and given to them by hand frequently, in small quantities, fresh and clean, so as to induce them to eat it with pleasure.† When the heat of the day is over, and they can remain abroad with ease, they may be again turned into the pasture, where they should be allowed to range with freedom all night during the mild weather of summer.

Cows, if abundantly fed, should be milked three times a day during the whole of the summer season;* in the morning early, at noon, and in the evening, just before night-fall. In the choice of persons for milking the cows, great caution should be employed; for if that operation be not carefully and properly performed, not only the quantity of the produce of the dairy will be greatly diminished, but its quality also will be very much debased; for if all the milk be not thoroughly drawn from a cow when she is milked, that portion of milk which is left in the udder, seems to be gradually absorbed into the system, and nature generates no more than to supply the waste of what has been taken away. If this lessened quantity be not again thoroughly drawn off, it occasions a yet farther diminution of the quantity of milk generated; and so on it may be made to proceed in perpetual progression from little to less, till none at all is produced. In short, this is the practice in all cases followed, when it is meant to allow a cow's milk to dry up entirely without doing her hurt. In this manner, therefore, the profits of a dairy might be wonderfully diminished; so that it much behoves the owner of it to be extremely attentive to this circumstance, if he wishes to avoid ruin. It ought to be a rule without an exception, never to allow this important department to be entrusted, without control, to the management of hired servants.† Its importance will be still more manifest from what follows:

In the management of a dairy, the following peculiarities respecting milk ought to be very particularly adverted to; some of them are, no doubt, known in part to attentive housewives, but they never yet, I have reason to believe, have been adverted to as their importance deserves; and by many have never been thought of at all. I put them down in the form of aphorisms, that they may be more adverted to, and the easier retained.

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* So little attention has hitherto been bestowed on this subject, that I do not know of any regular set of experiments that have ever yet been made with a view to ascertain the effects of any of the natural grasses that spontaneously spring up in abundance on our fields, either on the *quantity* or the *quality* of the milk of cows, and few that have been attempted even with regard to those plants that have been cultivated by art, as green forage for them; though it be well known that some particular kinds of plants strongly affect the taste, and alter the quality of particular products of milk. It is, indeed, in all cases, confidently asserted, that old pastures alone can ever be made to afford rich butter or cheese. This, however, I know from my own repeated experience to be a popular error, as I have frequently seen much richer butter made by one person from cows that were fed in the house, chiefly with cut clover and rye-grass, than that which was made by others, where the cows were fed on very rich old pastures. Mankind are, in general, disposed to throw the blame of every failure upon some circumstance that does not reflect on themselves as bad managers. Hence it is, that the grass of a farm is often blamed for the want of richness of the butter produced upon it; when, if the circumstances were fully investigated, it would be found to be occasioned by the unskilfulness of the dairy-maid, or the want of attention in the choice of proper cows.

† In very warm climates, where the heat is extremely oppressive to cows, and the flies are exceedingly troublesome, sheds open on one side, the roof being only supported there by pillars, would not afford them such effectual shelter as they would require. In these cases, the sheds should be walled up on both sides, and be left open only at the two ends, which, if properly placed, would produce a continued stream of air throughout the whole building, that would prove highly salutary to the cattle.

* If cows be milked only twice in the day, (24 hours) while they have abundance of succulent food, they will yield a much smaller quantity of milk in the same time than if they be milked three times. Some attentive observers I have met with, think a cow in these circumstances will give nearly as much at *each time*, if milked three times, as if she were milked only twice. This fact, however, has not, that I know of, been ascertained by experiment. There can be no doubt but they give more, how much, is not ascertained; nor whether it would be advantageous in any case to milk them four times, or oftener; or what effect frequent milking produces on the *quality* of the milk.

† Cows should always be treated with great gentleness, and soothed by mild usage, especially when young and ticklish, or when the paps are tender; in which last case, the udder ought to be fomented with warm water before milking, and touched with the greatest gentleness, otherwise the cow will be in danger of contracting bad habits, becoming stubborn and unruly, and retaining her milk ever after. A cow never lets down her milk pleasantly to the person she dreads or dislikes. The udder and paps should always be washed with clean water before milking; but care should be taken that none of that water be admitted into the milking-pail.

Aphorism I.

Of the milk that is drawn from any cow at one time, that which comes off at the first is always thinner, and of a much worse quality, than that which comes afterwards, and the richness goes on continually increasing to the very last drop that can be drawn from the udder at that time.

Few persons are ignorant that milk, which is taken from the cow last of all at milking, which in this country is called *strokings*, is richer than the rest of the milk; but fewer still are aware of the greatness of the disproportion between the quality of the first and the last drawn milk from the same cow at one milking. The following facts respecting this circumstance were ascertained by me many years ago, and have been confirmed by many subsequent experiments and observations.

Having taken several large tea-cups, exactly of the same size and shape, one of these tea-cups was filled at the beginning of the cow milking, and the others at regular intervals till the last, which was filled with the dregs of the strokings. These were each weighed, the weight of each cup being settled so as to ascertain that the quantity of milk in each was precisely the same; and from a great number of experiments, frequently repeated, with many different cows, the result was in all cases thus:

1. The quantity of cream obtained from the first drawn cup was, *in every case*, much smaller than from that which was last drawn; and those between afforded less or more, as they were nearer the beginning or the end. It is unnecessary here to specify these intermediate proportions; but it is proper that the reader should be informed that the quantity of cream obtained from the last drawn cup, from some cows, exceeded that from the first in the proportion of *sixteen* to *one*. In other cows, however, and in particular circumstances, the disproportion was not quite so great; but in no case did I find it fall short of the rate of *eight* to *one*. Probably, upon an average of a great many cows, it might be found to run at *ten* or *twelve* to *one*.

2. The difference in the *quality* of the cream, however, obtained from these two cups, was much greater than the difference in the *quantity*. In the first cup the cream was a thin tough film, thinner, and perhaps whiter, than the paper on which I write; in the last, the cream was of a thick *butyrous* consistence, and of a glowing richness of color, that no other kind of cream is ever found to possess.

3. The difference in the quality of the *milk* that remained after the cream was separated, was perhaps still greater than either in respect to the quantity or the quality of the cream. The milk in the first cup was a thin bluish liquid, like as if a very large proportion of water had been mixed with ordinary milk; that in the last cup was of a thick consistence and yellow color, more resembling cream than milk, both in taste and appearance.

From this important experiment it appears, that the person who, by bad milking of his cows, loses but half a pint of his milk, loses, in fact, about as much cream as would be afforded by six or eight pints at the beginning, and loses besides, that part of the cream which alone can give richness and high flavor to his butter. Many other useful corollaries may be drawn from it, which I do not at present stop to enumerate. Some of them will occur in the sequel.

Aphorism II.

If milk be put up in a dish and allowed to stand till it throws up cream, that portion of cream which rises first to the surface is richer in quality, and greater in quantity, than what rises in a second equal portion of time; and the cream that rises in the second interval of time is greater in quantity and richer in quality than that which rises in a third equal space of time; and that of the third than the fourth, and so on, the cream that rises decreases in quantity, and declines in quality continually as long as any rises to the surface.

My experiments not having been in this case made with so much accuracy as in the former, I have not been enabled to ascertain the difference in the proportion that takes place in equal proportions of time; but they have been so often repeated as not to leave any room to doubt the fact; and it will be allowed to be a fact of no small importance in the management of the dairy. It is not certain, however, but that a greater *quantity* of cream may upon the whole be obtained from the milk by taking it away at different times; but the process is so troublesome as not to be counter-balanced by the increased quantity obtained, if indeed an additional quantity be thus obtained, which is not as yet fully certain.

Aphorism III.

Thick milk always throws up a smaller proportion of the cream it actually contains to the surface, than milk that is thinner, but that cream is of a richer quality; and if water be added to that thick milk it will afford a considerably greater quantity of cream than it would have done if allowed to remain pure; but its quality is at the same time greatly debased.

This is a fact that every person attentive to a dairy must have remarked; but I have never heard of any experiment that could ascertain either the precise amount of the increased quantity of cream that might thus be obtained, or of the ratio in the decrease of its quality; but it ascertains the effects at least of mixing water with the milk in a dairy; and the knowledge of this fact will enable attentive persons to follow that practice which they think will best promote their own interest.

Aphorism IV.

Milk which is put into a bucket, or other proper vessel, and carried in it to any considerable distance, so as to be much agitated, and in part cooled, before it be put into the milk-pans to settle for cream, never throws up so much or as rich cream, as if the same milk had been put into the milk-pans directly after it was milked.

In this case it is believed the loss of cream will be nearly in proportion to the time that has elapsed, and the agitation it has sustained after being drawn from the cow. But I am not as yet in possession of any experiments that sufficiently ascertain how much is to be ascribed to the time, and the agitation, taken separately. On every branch of agriculture we find experiments wanting at each step we advance in our inquiries. The labors of no one man can complete the whole; but it is the duty of every inquirer to point out, as he goes along, where they are wanted.

From the Genesee Farmer.

FEEDING SHEEP.

To have sheep do well in our severe winters, they should not only have enough to eat, but it should be given to them in such a manner that they may receive the full benefit of the food given. Daubenton and some other writers have calculated that two pounds of hay a day is sufficient for a sheep; but this is greatly depending on the manner in which they are fed. Sheep more than most animals require feeding often, and in small quantities. They should never be fed less than three times in a day, and if the same quantity of food is divided into still smaller portions, by more frequent feeding, it will be the better for the flock. Every farmer should remember that sheep are very unequal feeders, in cold days eating nearly double the quantity they will consume in a warm damp one, and the feeding should be regulated accordingly. If indeed on such a day, their food is, as is frequently the case, all given to them at a time, their breathing upon it, and trampling upon it, will render it nearly useless to them. But we do not imagine that two pounds of hay per day will keep a sheep in good condition for four or five months, or that a ton of hay will keep nine or ten sheep through the winter of our climate. They require something more; they long to get at the earth, and since that is impracticable, green food of some kind should be given them with their hay. A few cut turnips, potatoes, or carrots, salted occasionally, distributed daily among the flock, will greatly assist in keeping them in good flesh and heart. Farmers would escape much of the disease, as shedding of wool, loss of lambs, and general injury of their flocks consequent on poor keeping, by giving that attention to this truly valuable animal, which none better repays.

From the Franklin Farmer.

PREPARING WOODLAND FOR SOWING GRASS SEEDS.

Richland, Ky., March 18, 1839.

In the winter of 1836, (say February,) I had some 60 or 70 acres of woodland previously belted, and in the proper stage for seeding in grass, but owing to the wet season in the fall, I could not burn the leaves sufficiently to let the seed reach the ground; after trying a large harrow and a large brush, which proved ineffectual, I adopted the scraper, made by taking a slab or puncheon five feet long and two feet wide, inserting therein a common split ox tongue and attaching one yoke of oxen and a horse thereto. It answered the purpose beyond my expectation. It threw the leaves in piles and left the ground perfectly clean and smooth, ready for the reception of the seed; the ground had been fenced in the fall, the brush pick up and grubbed, the logs remaining, and the stock kept off, so that the freezing had rendered it quite light.

I put one hand to drive, one to manage the scraper, and one to sow the seed; they went over from seven to eight acres per day, jumping the logs with ease. I sowed two gallons of clean timothy seed and half bushel of blue grass seed (cut) per acre, and I believe it has as good a set as any meadow, save where the logs and leaves remain. I believe it to be the surest and best way that woodland can be seeded, having tried burning the leaves and other modes: but it takes the ground nearly or quite as long again to become as well seeded as the plan above. If the information is worth inserting in your valuable paper you can do so. Yours resp'ly,

Stephen C. Brown.

From the Farmer and Gardener.

ADVANTAGE OF HIGHLY CALCAREOUS SOILS FOR MULBERRY TREES AND GRAPE-VINES.

Hempstead C. H., Ark. March 1, 1839.

E. P. Roberts, Esq.—*Dear Sir:*—The silk interest, which absorbs so much public attention in the older and more enlightened portions of the union, has not yet elicited much attention among us. The Chinese mulberry, so far as I can learn, is not yet to be found in this state, except in my little nursery. There it thrives admirably. The young buds, in sheltered situations, are at this time expanding sufficiently to feed young worms; and last fall, though we had an early frost, fresh leaves were to be found as late as the 10th of November—thus giving more than eight months vegetation for the precious insect. The three original trees that I have, of three seasons growth, are twelve feet high, and eight inches in circumference at the root; those of two years are nearly equal, and the sprouts of last year's growth, from two year old roots, are from six to ten feet high, and from six to twelve sprouts from each root. I find, also, from trial, that a highly calcareous soil, like our prairie, is best adapted to the culture of this tree. Observing that the native morus rubra delighted in the skirts of the prairie, where the soil contains 50 per cent. of carbonate of lime, I planted last spring a few of the morus multicaulis in this kind of soil: they far surpassed in every respect those planted in the adjacent sandy loam, though well manured. The wood is more firm, shorter jointed, more branches, and the leaves thicker and darker colored; resembling in this respect, the difference between the cotton plant growing in the sandy land and that in the prairie —the former growing taller, but the latter a thicker stalk, and producing a greater number of limbs and bolls. With my present planting, which I have finished, I shall have this year something like 20,000 of these precious trees growing. Having the fullest confidence in the final success of the enterprise, I am encouraged to go on, though alone, in preparing for the introduction of the silk-culture, nor shall I be detained by scoffs or sneers.

The grape-vine, also succeeds well with me, though for the three first years, the first was mostly lost by the mildew, yet last year, those vines when I had made the soil artificially calcareous in a high degree, perfected their fruit, without this disaster. Those vines, when marl was not used, mildewed, and cast four-fifths of their fruit as usual. This experiment, which I was induced to make from a hint once thrown out by Mr. Hebermont, appears to have fully succeeded. The soil was originally a stiff red clay, and had been an old cow-pen; I gave it a dressing of an inch thick of marl from the prairie, containing 75 per cent. of carbonate of lime (rotten lime-stone.) These, however, were European vines, of four different varieties, all alike subject to mildew. The native vines of our own forests which I had transferred to my garden, and cultivated, are sure and abundant bearers, not subject to any disease. I have planted this season a quantity of seeds of the European grape, in the hope that the vines, being actually native, may be better adapted to our climate. Should the experiment succeed, it will be a "consummation devoutly to be wished."

I cannot help considering the introduction of the silk-culture as forming a new era in agricultural enterprise, and calculated to be attended by the most important benefits to all classes of society. Could it be introduced here, in the elevated and healthy portion of our state, with the energy and intelligent enterprise with which it is impelled by New England ingenuity, with our many and great advantages of soil and climate, it would be the means of bringing vast tracts of land into cultivation that are now considered unfit for corn or cotton, from being broken and hilly, and subject to wash. This circumstance would be no objection to the cultivation of the mulberry, but rather an advantage; and besides, such lands are generally watered by the finest springs, which is seldom the case with the extensive alluvial plains that are usually selected for large cotton plantations. Unfortunately, our best cotton lands lie bordering on the rivers, that are skirted by extensive swamps, the first reclaiming of which is attended by an enormous sacrifice of human life, and none but the African race can endure the labor of cultivating them. But our elevated lands, produce the mulberry equally as well as the river lands, and are extremely healthy. And the silk-culture, not being adapted to slave labor, might occupy the hills, while cotton should be confined to the low-lands. They need not interfere with each other, but be a mutual support, for each should employ a distinct class of the population, and occupy different locations. The alluvial plains of the rivers will be laid off in large cotton plantations, with but few white families, while the hills will be covered with a dense free population, of small farms, and family manufactures of silk. The grape, also, that now luxuriates in native wildness, will be subjected to cultivation, and made to vary, beautify and enrich the scene.

Respectfully, yours.

REMARKS BY THE EDITOR.

In sundry parts of the former volumes of this journal, we have urged the advantage and necessity of using calcareous soils for grape-culture; and, more recently, have expressed the opinion that the same kind of soil was peculiarly adapted to improve the growth of mulberry trees. But as to both, our views were more theoretical than practical, and were deduced from indirect testimony, rather than positive facts. In the foregoing highly interesting article (to us at least, and on this account,) are presented the first positive proofs, in the greatly superior growth, or product, of both the morus multicaulis and of grape-vines, on soils which would be excessively calcareous for most other plants. The facts are highly important; and the truths which they sustain, if properly appreciated and applied, would be worth millions of dollars annually to this country, even if confined to vine and mulberry culture alone.

The foundation and origin of our opinions as to these particular adaptations of calcareous (and highly calcareous) soils, will be here concisely stated. Vine-culture, both for the production of grapes and of wine, so far, has been in this country, generally as unsuccessful, as it is generally successful in the wine regions of Europe. In examining for a difference of circumstances, sufficiently marked and general to be the cause of this difference in effects, nothing satisfactory was offered to our mind, except the remarkable difference in the constitution of soil, which we had before learned from prior investigations, directed to more general and more important objects. The well cultivated and most productive soils of Europe, are generally calcareous; and the particular vineyards which are celebrated for producing the most valuable wines, are known to be on calcareous soils. On the other hand, we had fully established, to our own satisfaction, the novel and astonishing fact, that in all the Atlantic slope of these states *there was no calcareous soil, proper*—and that there was but a very small proportion even of soil altered by shell-beds coming to the surface, broken lime-stone, or other such rare and accidental admixtures. Hundreds of miles might be passed over, in travelling through the country, without the traveller coming in sight of an acre, or even a square-yard, of natural calcareous soil, or any containing even so small a proportion as one-thousandth part of carbonate of lime. And yet, so sure are the marks of calcareous earth in soil, that the traveller who had properly investigated the subject, could pronounce as safely and correctly as to its deficiency, on the most transient observation, as upon thorough chemical analysis. Upon subsequent investigation and information, we further learned the very different and scarcely less important fact, that most of the great prairies of the west were as remarkably constituted, in their great abundance of calcareous parts, as the eastern regions are for the entire deficiency. Indeed, the prairie regions of this country present the only considerable soils known in North America, which contain any great proportion of carbonate of lime, or where that ingredient is in hurtful excess, or is so often the case in some parts of Europe.

But all the trials of grape and wine culture which had been made in this country had been confined to the non-calcareous region; and so far as we knew and believed, not an acre of vines grew on highly calcareous soil, if even made moderately calcareous by compound manures, applied without such design. It is not that calcareous soil is necessary to make the vines grow luxuriantly; nor *always* to make them yield a heavy crop of fruit. But we deemed it essential to make the vines as regularly and certainly productive in well ripened fruit, as in other regions, and still more, to render it fit for wine of sufficient strength, and best quality. Climate may have much agency in preventing equal success in this country; but the defect of the soils heretofore used is not the less certain, and alone, as we think, a sufficient cause of general failure. It was on these grounds that we urged on vine-culturists, through this journal, to use calcareous manures; and by private correspondence also, on Mr. Herbemont particularly, who had done so much for this branch of industry, we endeavored to impress the propriety of making highly calcareous at least as much of a vineyard as would serve for a separate making of wine. But though he was satisfied with the correctness of the views, his location, remote from calcareous manures, prevented his putting them to practical use; and until reading the foregoing article, we had not heard of any such designed experiment, or even of any comparison of results, between the products of vines on calcareous and non-calcareous soils. Our own position, removed from our land and cultivation, and therefore being incapacitated from superintending either, forbade any such trial of a new and costly culture, merely for experiment with a view to the promotion of public interests.

In regard to the peculiar fitness of calcareous soils for mulberry trees, our opinions were more lately formed, but not the less decided; and in this also, the first positive and unquestionable evidence is furnished in facts stated in the foregoing letter. The facts which had induced our forming this opinion, (and which was stated in the last, and in previous numbers of the Farmer's Register,) were the following, which seemed full and sufficient.

On our own farm, and elsewhere on the borders of James River, where the great diversity of natural soils afforded excellent grounds for such observations, both the white mulberry and the native mulberry trees are a common growth on the hill-sides, and the few other places where the marl reaches the surface, or affects, by admixture, the character of the soil. And on the hundred-fold more extensive table lands, of poor and acid quality, mulberry trees are rarely found. The remarkable and seemingly peculiar fitness of the river hill-sides for this growth is generally known to the residents; but it is not known, what is certainly true, that the presence of calcareous earth in these soils is the sole cause of this peculiar fitness. So strongly has the fact been impressed on some cultivators, though without inferring the cause, that the white mulberry is considered as a troublesome cumberer of the ground on some arable lands, the growth of which it is difficult to keep down and impossible to eradicate, by the periodical cultivation of grain crops. Very recently, we heard an excellent farmer object to planting the morus multicaulis on his land, because he feared that it would so spread as to become as troublesome an intruder in his fields, as he had already found the white mulberry to be. It may be remembered by some of our readers, that the native mulberry leaves which were of such extraordinary large size, as stated at page 417, vol. VI. Far. Reg. were from a young tree which grew in a bed of poor sandy marl.

What has been already stated on this head, however defective and incomplete as proof, will be enough to induce those who will think and reason to pursue the investigation of the subject, and supply the unquestionable and direct evidences which we have not to offer. Sooner or later, it will be a truth of universal acceptation, that, in addition to all the other advantages offered in the use of calcareous manures to agriculture, that both vine and mulberry culture, in a peculiar and remarkable degree are improved by their liberal application.

From Loudon's Gardener's Magazine.

NOTES TAKEN FROM THE NARRATIVE OF A HORTICULTURAL JOURNEY IN GREECE, DURING THE SUMMER OF 1837.

By Eugene Achille Baumann, of the Bollwyller Nursery.

I know not whether a short account of the present state of horticulture and agriculture in Greece might not interest some of your readers. It is true that this country is daily visited by travellers, your countrymen in particular, who, in their narratives, infinitely more interesting than mine, introduce every thing worthy of notice; but this celebrated country presents so many curiosities of all sorts, that horticulture, the subject which particularly interests me, and which is at the very lowest ebb, could never have particularly attracted the attention of any one having a different mission from mine.

After having visited almost every part of Italy, where I found many things to interest me, I arrived at Trieste in the spring of 1838, regretting much to be obliged to leave that fine country. At Trieste, however, I received the necessary instructions from my friends for undertaking a still longer journey. I was to proceed to Athens in Greece. The object of my journey was to open some commercial negotiations with the amateurs of the country, as well as with those persons at the head of the government who might be favorable to an enterprise of this sort. A new country, or, rather, one rising out of total ruin, like Greece, presents many fair chances: for, the want of vegetables and fruits, as well as of forest trees, is very soon felt in a country so situated. What particularly induced my family to this step, was, that for several years past we had been sending ornamental and fruit trees to a considerable amount to the Greek government, as well as for the plantations of King Otho.

I embarked about the middle of May, 1837. Finding a favorable opportunity for extending my journey to Smyrna and Constantinople, I went direct to Smyrna*; thence I went by land to Brussa and Scutari, and arrived in Greece, after a stay of some weeks in Constantinople, and a quarantine of twenty-four days in the Isle of Syra.

I arrived in Greece about the end of July. What a difference between the coasts of Attica, or of the Peloponnesus, and those which I had just passed! The shores of Asia Minor, of the Bosphorus, and of the Dardanelles, are filled with gardens, which present to the eye of the traveller a vigorous vegetation, as varied as the nations which inhabit them. Those of modern Greece were naked under the burning July sun; the little vegetation which had flourished there had been completely withered up; and before I perceived some signs of habitation, I thought I was landing on a rock abandoned at once by man and nature. I saw nothing above the surface but some remains of the gigantic monuments of the ancient Greeks.

I landed at the Piræus, and proceeded, soon after landing, to Athens. The road which led to the city was new; on the right and left were planted, at a considerable distance from each other, plane trees, poplars, alders, and some walnut trees. It was rather difficult to distinguish these trees at first, as they were generally in bad condition, and the greater part of their imperfect heads were without foliage.

The road also passes through a forest of olive trees; it is the only thing in the neighborhood of Athens, useful to the inhabitants, that has not been entirely destroyed by the stolid ferocity of the Turks and Egyptians. This forest made no better impression on my imagination than the first aspect of the country. Those who have seen forests of olive trees know that their livid hue entirely changes the character of the landscape.

I arrived at Athens; and the first thing that struck my sight, that delighted me, was not so much the imposing aspect of the Acropolis, and of the Temple of Theseus, as the finding of a date tree, nearly 50 ft. high, growing in the middle of the Via d'Hermes. This date tree had continued to grow, and had not been injured by any one; besides this specimen, I saw five or six others in the different districts of the city, also several cypresses, but these were all.

It must be confessed that Athens, for a celebrated city, presents but a denuded aspect; this cannot be said, however, of some places, situated at a little distance from the city, such as the village of Marupi, that of Kephyssia, Angello-Kibi, &c. In these places we meet with a tolerably vigorous vegetation. At Kephyssia several foreign ambassadors have country houses; the Russian ambassador particularly has a large establishment; and there is there a magnificent group of plane trees, *(platanus orientalis,)* planted, no doubt, by some Turk. There are also a considerable number of mulberry trees, some fruit trees, pear, apple, and plum trees. Close by is a very old plantation of olive trees; and in the neighborhood flows a small rivulet, the banks of which are adorned by a very vigorous vegetation of *laurus nobilis, myrtus communis, vitex. agnus castus, ceratonia siliqua, melia azederach,* several *rhamnuses, &c.* These trees, both large and small, are every where alternately intertwined with vines and *vitex agnus castus;* and, where the moisture does not reach, an immense number of myrtles grow. *Pistacia lentiscus* also grows there profusely; in short, one is agreeably surprised at the great variety of brilliant foliage which abounds there. The *nerium oleander* is particularly beautiful; it towers above the other shrubs which surround it, and presents a flourishing bouquet throughout the year.

These villages were formerly places of rural retreat for the Turks, as they are now for the Greeks. I found every where the remains of Turkish houses; which have been quite destroyed, except the fountains, which are always shaded by some fine planes, or horse-chestnut trees *(æsculus hippocastanum).* I have never seen these trees so well grown, or so perfect, as in the neighborhood of these fountains; it appears as if nature herself chose to protect and shade those fountains which the Turks erect wherever they can find a spring; and near each is inscribed a passage from the *Koran,* which invites the toil-worn traveller to come and quench his thirst.

This is all that can recall an idea of what horticulture was in Attica, before the war against the Turks; and while it continued, nothing could be done. During my stay, however, I had an opportunity of seeing that, under Bavarian influence, the Greek government will bring the horticulture of this country to a high degree of perfection. Before the death of Capo d'Istrias, a nursery had been formed near Nauplia, which was then the capital; but this nursery is now neglected. I saw the greater part of the fruit trees which were sent to it from our nurseries at Bollwyller, either dying or already dead, although but recently neglected. At Athens, a new nursery had been made, and, while the greatest care was bestowed on it, the former was abandoned to neglect, and finally given up.

The Athenian nursery is under the direction of Dr. Fraas of Wurzburg, a young man who devotes himself with ardor to the labors and cares which his charge naturally brings along with it. The place which it occupies was formerly the garden of a Turkish proprietor, but the king bought one part of it, and the government the other.

Hitherto only such trees and shrubs as were most wanted in the country have been planted in the government part of this garden. In the part belonging to the king, such culinary vegetables are cultivated as the country does not produce naturally; such as cabbages, asparagus, salads, peas, kidney-beans, &c. A great number of fruit trees have also been planted, which grow well; some plum and pear trees were there previously, as well as some vine stocks, and mulberry and pomegranate trees. Fig trees were plentiful.

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* I proceed to Smyrna, touching at Ancona, Corfu, Patras, and Athens, and reach Smyrna by Syra and Scio.

Of ornamental plants, Dr. Fraas had planted a certain number of dahlias, which I brought from Trieste and left at Athens, on my first journey there. On my return, after a very short period of time (two months,) I found all these plants grown and in beautiful bloom; besides this, I saw a fine collection of annual plants, which grow there with unexampled rapidity and vigor.

We may rationally conclude that the country has not always been so bare of vegetation as it is at present: the soil is very fruitful and good in the plains; though less so on the elevations of the mountains, which are generally calcareous. The best proof of the fertility of the soil is, that Dr. Fraas having had a number of mulberry trees transplanted, the stems of which were generally more than a foot in diameter, they all, without a single exception, continued to grow. The year after their transplantation the heads were a little cut, and in a few months afterwards, they formed new ones, which exceeded the old ones in strength, size, and thickness.

The Athenian nursery is situated in the forest of olive trees mentioned at the beginning of this paper, at about half a league from Athens, on the road which leads from that city to Eleusis.

On the other side of the road, the military commander has had the soil prepared, where the olives are planted regularly, and cultivated for the advantage of the Bavarian garrison; peas, kidney-beans, cabbages, turnips, &c., are raised here very successfully. This place, as well as the king's garden, can be easily watered by a conduit, which proceeds from the city. Watering is very necessary, and it is not surprising to see an almost total want of vegetation in so warm a climate; at Athens particularly, since this rivulet, if I may so call it, is the only one which supplies water during the whole year. We read in ancient history, and see in many modern maps, several rivers marked near Athens. In the time of Alexander the Great, as we are told in history, a small part of his cavalry was sufficient to exhaust the water of the Cephisus; at present its bed is very perceptible, but I never saw a drop of water in it. In the neighborhood of the city several other dried up beds of rivers are also pointed out.

The resident plenipotentiary of Austria, M. le Chevalier Prokesh von Osten, has also formed a garden in the English style. He planted chestnut trees, *catalpa syringæfolia*, *acacias* of different sorts, some of which have grown, but many have perished. Prince Puckler Muskau, who arranged the plan of this garden, advised him to plant at first *en masse*, all the trees that would grow rapidly during the rainy season, to procure, at least, some shelter for trees of a better quality. He did so, and, as far as I could observe, he will derive advantage from it. The poplar grows with astonishing rapidity, notwithstanding the great drought. *Pinus pinea* and *P. maritima*, which grow every where on these shores, would also be ornaments to these gardens, as their forms are agreeable; and the other species of *coniferæ*, cultivated in our plantations, do not thrive so well here as these two species.

An Italian landed proprietor has also formed a garden in the neighborhood of Athens. I observed with pleasure the rapid growth of a great number of fruit trees, chiefly apple and pear trees, which he had planted; many of them were loaded with fruit. It is also worthy of remark, that date stones, sown in the open air, have come up and grown admirably, in this gentleman's garden, as well as in the king's garden.

Before my departure, M. Lang of Darmstadt, a very able architect, was commissioned to make a plan of a private garden, which was to be formed near the new royal palace, the building of which was proceeding rapidly. A public garden, in the English taste, was to be joined to the former, to surround it, and be a place of resort for the population of Athens.

The new palace will be magnificent and very large. The beautiful marble of Pentelicus is almost the only material used in its construction.

M. Lang decided immediately on the Italian style for the king's private flower-garden, marking on the plan the place for a good number of palm trees, and groups of orange, lemon, and oleander trees. The whole to be divided into compartments by low walls, ornamented with statues, vases, &c., of marble, which they expected to find in the ruins of the ancient monuments. I have no doubt that, when the whole is finished, I shall be put in possession of the plans and elevations, and I shall then have much pleasure in transmitting them to you.

I think Greece is a country in which a garden well planted and executed would have a magical effect. All sorts of trees might be used in the arrangement. I even think a great number of South American trees would thrive. What could we not effect by uniting the *passiflorus kennedyas*, and the superb and light *acacias* of New Holland, with groups of oleander, myrtle, and *laurus nobilis*, crowned by magnificent date trees, evergreen oaks, *acacia julibrissin*, *cupressus pyramidalis* and *horizontalis*, and orange and lemon trees! All these would thrive; and the Greeks would be happy in being able to enjoy their gardens all the year round, while we are obliged to witness five or six changes annually, every one more disagreeable than the other.

Add to this the magnificent and imposing views of the sea, of the Gulf of Salamis, of the ruins of the Acropolis, of the Triumphal Arch of Adrian, of the ruins of the temple of Jupiter Olympus, &c., and we may easily conceive the beauty that might be given to an Athenian garden.

I shall not forget to communicate to you, at the same time, some particulars as to the customs of the Greeks themselves, with respect to the subject that interests us.

Their culinary vegetables consist generally of young pumpkins, not fully grown, *cucurbita lagenaria?*, with other species and varieties; the fruit and seeds of *hibiscus esculentus* are used exactly as peas and kidney-beans are here. Their taste is rather sour and very refreshing; tomatoes *(solanum lycopersicum)* are used all over the country in almost every dish. *Cicer arietinum* is eaten by the common people, who generally carry some of these plants in their hands, eating the seeds without any preparation. *Cucurbita citrullus*, the water-melon, is brought in immense quantities from the islands of the Archipelago. The people eat them greedily; they are very good and refreshing, but somewhat dangerous. Several other kinds of melons are also brought from the islands, some of them of an exquisite flavor. The flail is not used for thrashing out the corn in

Greece. In every village there are round paved places, where the inhabitants spread out their corn, and have it trodden out by horses. On the arrival of the Bavarians in this country, an officer ordered several flails to be made, with the intention of teaching the Greeks their use; and some soldiers were set to work with them for this purpose. The Greeks, of course, approved of the new way for them; "but why should we tire ourselves," said they, "when our horses can do it as well with their feet?"

That awkwardness, or idleness, which is perceptible on many occasions, struck me particularly on seeing them digging or trenching the ground. It is extraordinary how men in this warm climate can remain bent, and sitting on the calves of their legs, or, rather, doubled on their legs, for hours together, and not upright, as every where else, working with implements which never have longer handles than from 2 ft. to 2 ft. 6 in.

The climate of Greece being so favorable for the vine, accounts for the country also abounding in wine. We must not, however, expect to see the vine cultivated regularly; the stocks are planted, they are allowed to grow, and they are thought of no more till the time of the vintage. Those wines which come from the islands are very good and light; those, on the contrary, which are made on the continent, for want of cellars and reservoirs for keeping them in, are always mixed with resin or gypsum. The taste produced by this mixture is at first extremely disagreeable, particularly when gypsum or plaster-of-Paris is used. I soon got accustomed to the mixture of resin, which seems at first to be turpentine. The latter custom, in this warm climate, is a very good means of promoting digestion.

This is nearly the amount of the notes which I wrote during my stay in this country. I can, if you wish it, communicate other matters to you, perhaps still more agreeable than these.

Soho, London, September, 1838.

From the Southern Agriculturist.

IRISH POTATOES FROM SLIPS.

Irish potatoes may be grown from the slips, like the sweet potato. As soon as your potato tops have grown about one foot high, cut them off and plant the same as you do to the sweet potato, only have the beds nearer each other. The potatoes from these will be later, but they will be more numerous, and decidedly more mealy.

OLLA PODRIDA.

To the Editor of the Farmers' Register.

March 22nd, 1839.

In one of the late numbers of your Register, I have read what I consider a very just complaint against most of your early correspondents, who are yet in the land of the living. It is, that they appear to have grown weary in the good work of contributing to your paper, as their communications have gradually been diminishing in number and frequency, until you rarely hear from them at all. You and your readers, I think, will all acquit me of this fault, for my fear has generally been that I should over-do the matter; but nevertheless, I will venture to send you something, lest others better qualified should be unmoved by your appeal.

You must long ago have been convinced that I most heartily wish success to your *Register* on *your own* account; but you have yet to learn that I wish it also, because I take a pride in it, as a work of good old Virginia, concocted out of her own materials, and by a native-born Tuckahoe.* To aid it, therefore, in every honest way that I possibly can, is a matter which occupies much of my thoughts, and prompts me, perhaps oftener than is useful, to be scribbling for it. This, however, having no other object than the good of our cause, is never designed to impose upon you more trouble than that of perusal; since to see myself in print, very rarely, if ever, forms any part of my motive for addressing you. Let me then again repeat, as I have often done before, that you are at perfect liberty to destroy whatever of mine you do not deem fit to publish.

At present I have nothing to offer but certain suggestions brought to my mind by your just complaints of the increasing want of original communications—suggestions, which, if followed out, as your own judgment might direct, would add, I am sure, considerably to the interest of your highly useful journal. One of these is, to re-publish, when you are hard run for fresh matter, short articles, from some of our comparatively old agricultural works; for instance, the American Farmer, which consists of 15 quarto volumes. My reasion for this recommendation is, that such works, when published periodically, are almost always treated as waste paper. Their contents, therefore, are very soon entirely lost and forgotten. *I*, who read every agricultural work I can lay my hands on, and carefully preserve all I subscribe for, was forcibly reminded of this fact a few days ago, while searching the American Farmer for something of which I had a faint, but imperfect recollection. My attention was so completely arrested by several highly interesting and valuable articles, which I had utterly forgotten, that I was near losing sight of the first object of my search. Had I seen them in your paper, without a mark of quotation, I have no doubt that I should have taken them for original communications to yourself; and I am very sure that the same thing would happen to hundreds of your other subscribers; for there are multitudes of us agriculturist who require *"line upon line,"* and *"precept upon precept,"* to enable us to retain in our memories what we learn of our profession from books; especially if they are published piece-meal.

Still older works than the American Farmer might often afford some very useful information, mixed up with various things which would probably prove to many, as they have done to me, exceedingly amusing from the very odd and queer style in which they are related, as well as from the subject matter itself. Take, as a specimen, the following droll captions to certain chapters in a work published in England about ninety years ago, in eight octavo volumes, by one William Ellis, who signed himself "Farmer," and called his book "the Modern Husbandman."

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* Would you believe it? There are hundreds of native-born Virginians still so ignorant of the early history of their own state as not to know that a root called "Tuckahoe," was a common article of food among the Indians, when Virginia was first settled by the English. It is indeed, a great botanical curiosity, (now very scarce,) for it has neither root in the ground, nor stem above it; but grows a few inches below the surface, apparently as unconnected with the soil as a buried cannon ball would be. It is oval in shape, and varies in size from that of a goose egg to that of a man's head. The coat is rough and of a dark brown color; the inner substance is very white, similar in texture to that of the yam, and of an insipid taste. I believe it is found in the Carolinas, as well as in Virginia.

Captions.

"A curious case, proving how a farmer lost great part of his wheat crop by his ignorance and covetousness."

"How one farmer broke, and another had like to do the same, by wrong ploughing the ground."

"How a yeoman lately living near Chasham, got a considerble estate by managing his land better than most of his neighbors."

"How some farmers clean and manage the top bushel of a sack of wheat for the better sale of the whole quantity they bring to market."

[By the way, we have been much scandalized on our side of the Atlantic, if we want much teaching in this art.]

"How a farmer starved his cow, and thought it occasioned by witch-craft."

Some of this sagacious fellow's descendants, I suspect, must have emigrated to and multiplied exceedingly in the Ancient Dominion; for we witness even now, not a few cases of this species of witch-craft in our good old state, especially during the two first spring months.

"How a gentleman run out part of his estate by ill management, and recovered it by his good conduct." If Farmer Ellis had only added to this information how the recovery was to be effected when the *whole* estate was run out, instead of *a part*, his recipe would have been above all price, particularly on the south of "Mason and Dixon's Line." But I have given you titles of chapters enough to enable you to form a pretty correct idea of the character of the work, although I cannot dismiss my notice of it without a few more remarks. As a book of receipts, I have never seen its match, at least in point of number, except the 'Universal Receipt Book," which, as Maj. Downing would say, "beats all nature." What think you of no less than eighteen consecutive ones for killing rats!! and most curious things they are. One is to bell the rat instead of the cat; another is, to singe one of these vermin and turn him loose. This struck me as peculiarly good, for I had a distinct reminiscense of an unlucky snuff, which I accidently received some years ago, of this most offensive odor; and I determined to try the experiment forthwith. But my operator, who was a small negro boy, without any experience in the business, singed so closely that the unfortunate rat gave up the ghost before he had an opportunity of funking his former associates out of their respective hiding-places.

You will probably think that if the rest of Farmer Ellis' receipts are like the two foregoing, they are of very little value, but you may take my word for it, that many of them appear well worth trying, and that his whole work deserves a perusal.

From this author I have learned what I never knew before, in regard to that excellent grass, the lucerne. He begins his account of it with the following words: "I must confess *he* has hit this, the best of any of the grasses." According to him, it was first known to the English at Aleppo in Syria. In Arabia Felix, he says, "they got vast burthens of it once a month. From Aleppo, it was brought into several parts of the Mediterranean, and particularly at Minorca, it grows in such perfection that it is now their chiefest subsistence for their cattle. From thence it got more forward into Europe, and is now planted in abundance of places, and more like to be, for its many extraordinary beneficial qualities." He proceeds to remark: "I cannot find by what authority late writers call this grass by the names of Medic-clover, snail-trefoil, or Burgundy fodder, otherwise than that they have a mind to give it nominal flourishes, without any warrant from former authors," &c. In regard to the quality of the seed, and the proper quantity for an acre, sown broadcast, he says, that no seed are good but the purple or brown, that ten pounds per acre should be used. By the way, he states the mode which I have seen mentioned elsewhere, and have proved to be good, by which we may ascertain the soundness of any seed resembling the lucerne in its nature—such for instance, as clover, turnip, cabbage, rape, mustard, &c. It is simply to put them into a hot shovel, where they will soon pop, if they are sound.

Were I to give you all that I have found in this old writer, to amuse and instruct me, I should be obliged to send you a pamphlet, instead of this rambling letter; I must therefore "stay my hand," although I cannot prevail on myself to do so without adding some excellent advice which he offers both in prose and verse. The first is from a rhyming farmer of Queen Elizabeth's day, whom he called "old Tusser," and whose pithy admonitions he heads with that well known and admirable precept, "Make hay while the sun shines." But let Tusser speak for himself, and thus he sayeth:

> "If weather be fair, and tidy thy grain,
> Make speedily carriage for fear of a rain;
> For tempest and showers deceiveth a many,
> And lingering lubbers lose many a penny.
> Be thankful to God for his benefit sent,
> And willing to save it with earnest intent."

Take the following very brief apothegm as a specimen of Farmer Ellis' own poetical talent, for it seemeth that he also was a perpetrator of verse.

> "Do not with ignorance unjustly deal,
> All secret wrongs to Heaven have appeal."

The other article is a part of a letter from one of his numerous correspondents in reply to one of his own; and he thus quaintly doles out to us, what I think you will pronounce well worthy the attention of us all. Here it is,

"As to your comparison: most men, 'tis true, of any figure in life, are too prone to inconstancy and change in all their actions, as well as appetites; and must have the whole globe of earth and sea ransacked to gratify their inordinate desires. But this luxurious disposition is not, I hope, so much implanted in our natures, as 'tis owing to our indulging ourselves too much to ease and idleness; for set a good joint of meat before my ploughmen or laborers, every day the same, give them but enough, and I will answer for them, they will behave themselves very well in their several attacks, and be lusty and healthy at the year's end; though perhaps, their lazy master's stomach would have risen against the third meal. Nor did I ever find that my working horses or oxen refused the same hay and corn the year round, but eat clean up as much as was given them, while those that were pampered and fed, and kept sleek and fine for market, were as whimsical and squeamish as the nicest beau. This must be attributed to the want of due labor and exercise. 'Tis just the same with the earth; for take a small piece, and manure it very well for some years, without either ploughing, or mowing, or feeding on it, *for there are exercises of the earth*, and it will denote a foulness of stomach, by putting forth nothing but rank weeds; but after you have given it sufficiently of these exercises, you need not fear clogging its stomach" (a very needless caution this, to most of us Virginia farmers,) "with too much and too constant food, if it be a proper sort; for it will always manifest a good digestion, by the grateful returns it will make you."

On the subject of agricultural machines and implements, Ellis treats very largely, and describes several as long used in England, which have been supposed, in the United States, to be modern inventions of our own. I will invite our brethren to make trial of at least two which he extols very highly. These are the prong-hoe, (or "hough," as he spells it,) and the "beck-hough." I can say of the first, after more than twenty years use, that it is incomparably the best implement for taking up and throwing coarse manure into a cart or other vehicle used for the purpose, that I have ever seen. It is also far preferable to any other for cleaning out wet drains obstructed by trash of any kind, and it is an excellent tool for hoeing up garden ground, as it pulverizes at the same time. Although it is much used in some parts of our state, yet I know that in others, it is entirely unknown, and therefore I confidently recommend it. The prongs (three in number,) should be flat, about an inch or inch and a quarter wide at the widest part, and tapered to ¾ of an inch at the point, which should be sharp and well steeled. Their length should be about that of a common billing-hoe, and they should be slightly curved inward. The whole width of the implement, including the spaces between the prongs, many be about eight inches, although the whole size should be proportioned to the strength of the person who is to use it. The beck-hoe I have never seen, but am so well satisfied with Ellis' description of it, that I shall certainly try one as soon as I can get it made. He says, "it differs from the common pick-axe, or mattock, only by having its two ends about four inches broad." He adds that, "at Farnham, in Surry, it is so esteemed, that there is hardly any other tool used to weed their hop-grounds and allays, and to keep them clean and hollow; for by its make, the digger can enter the earth deeper than with either the prong-hand-hough, or prong-spade; and it is with this tool that they keep their plantations of hops in a most fine tilth," &c.

Whilst I am on this subject, permit me once more to recommend, most earnestly, the *drag-log*—the credit of contriving which is entirely due, I believe, to your worthy correspondent, Mr. Gay. For the combined qualities of simplicity, cheapness, and utility, I have met with nothing that will bear any comparison with it in regard to the purpose which it is designed to effect, and that is *pulverizing the soil*. This it will most certainly effect by being dragged only once over the surface, far better than either harrows or rollers can do it by passing two or three times, while the draught is very little greater, if any, than that of the largest sized harrow made for two horses. The first time I used it, (which was as soon as I could get one made, after reading Mr. Gay's description of it,) I became thoroughly satisfied of its great superiority to rollers and harrows for reducing land to fine tilth preparatory to sowing or planting any thing; and I have been using it ever since. Both the last mentioned implements are very useful for other purposes, and therefore, nothing here said is designed to supersede them by the drag-log, but merely to represent their great inferiority as pulverizers and crushers of rough, cloddy land.*

And now, my good sir, having succeeded in a part at least, of my design, which was to make this epistle a kind of hotch-potch affair, in the hope of affording to you and your readers some variety, as well as a mite or two of what may be useful, I will conclude by proposing, (as you seem fond of giving captions to the communications of your correspondents,) that you should entitle mine an "Olla Podrida, or dish of all sorts," and heartily wishing that it may prove palatable,

I remain, dear sir,
Your old friend and constant reader,
J. M. G.

From the Farmer and Gardener.

BROOM-CORN-CROP.

The proprietors of the broom factory at Georgetown, D. C. take pleasure in laying before their agricultural friends, an accurate statement of the product of this new grown crop. The estimate is made on the measurement of seven acres of land the last year, although the season was unfavorable for corn. From the seven acres they secured 24,488 lbs. of broom brush, cut with six and seven inches stalk, with seed on.

After taking the seed off, the net brush weighed, - - - -	5,549 lbs.
The seed measured from the same, 473½ bush. and weighed 40 lbs. per bush. making	18,939 do.

Recapitulation.

Net weight of the brush from 7 acres,	5,549 lbs.
Net weight of seed from the 7 acres,	18,939 do.
Making the gross weight grown,	24,488 do.

Value of crop as follows:

5,549 lbs. of net brush, at 5 cents per lb. or $100 per ton, - - -	$277 45
473½ bushels clean seed, at 50 cents per bushel, - - -	236 75
	$514 20
Amount of crop grown per acre on seven acres, - - -	$73 45¾

It would be well here to state, in the year 1835, with a more favorable season, the same seven acres of land was planted in Indian corn, and produced 57½ bbls. and sold at $4 50 per bbl. $231 75

Making the difference in favor of broom-corn, on seven acres, - $272 45

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* The drag-log was fully described, and its peculiar advantages stated at page 751, vol. ii, and 616, iii. Far. Reg.—Ed.

The Indian corn-crop per acre, was about $33 10¾. Making the difference in favor of broom-corn $40 35.

For planting, our own experience has taught us to lay the land off three feet each way, so as to avoid hoe-labor. This distance will give 4800 hills per acre. On the above described land we would leave from 10 to 15 stalks in the hill. The preference is given to the finest brush. Half a gallon of seed will plant an acre carefully dropped.

Any farther information can be had, by application at the factory. The propretors of the Georgetown broom factory have, with great care, selected their earliest and best seed for planting, and offer it to the farmers at a moderate price. For securing the harvest, will be hereafter noticed.

GEORGE T. MASON & Co.

From the Second Report of the Agriculture of Massachusetts.

DAIRY HUSBANDRY.

I proceed to speak now of another of the great interests of the agriculture of Berkshire—the dairy.

The dairy business has always been a great business. For a time it gave way to the raising of fine wool, when the prices of that staple were high. Since the abatement of the demand for wool, with that caprice for which mankind always have been, and there is reason to think always will be remarkable, many farmers have sacrificed their flocks; and are now giving their exclusive attention to the dairy husbandry. These changes, in matters so important as the dairy or the sheep husbandry involving, as they do, a considerable investment of capital, and many expensive fixtures, cannot be suddenly or frequently made without risk of serious loss and disadvantage.

The county of Berkshire is admirably adapted to the dairy husbandry. Grass is every where abundant. The soil is suited to the cultivation of esculent vegetables in the highest perfection. Several increasing manufacturing villages, with their swarming population, require supplies from the farms in the vicinity. Besides this, the great mart of the country, the city of New York, is easily accessible. Most of the farmers in Berkshire can reach Hudson with their produce, by a journey of four to eight hours, and put on board the boats at four o'clock P. M., it is in New York by an early hour the next morning. The farmer usually allows two cents a pound commission for the freight and sale of his butter; and, upon other produce, it is equally reasonable. He does not return from the river empty; but carries home a load of plaster, or of articles of necessity for his family. The great roads to the river, after the hills are surmounted, are among the best in the whole country. The rail-road, already open from Hudson to West Stockbridge, will afford to many of the farmers all the facilities they can desire for reaching the Hudson river.

Produce and expenses.

1. *Egremont.*—I will, in this place, state, as an example, the operation of a farmer who resided about twenty-five miles from Hudson. The great object of his attention was the making of butter, which was sold every week in the New York market.

From 18 cows he sold 2400 lbs. butter, at 23 cts. net. With these cows he fed 17 spring pigs until October, whose average weight was 177 lbs. each; half of this pork, say 88 lbs., was to be credited to the cow. He is of opinion, that when pork is $10 per 100 lbs., a cow will give at least $8 worth of pork per year.

Cow, Cr.

133 lbs. butter, at 23 cts., (comm. paid,)	$30 59
Pork, - - - - - - - -	8 00
	$38 59

Cow, Dr.

Wintering, - - - - -	$12 00	
Pasturing, - - - - -	5 00	
Salt, - - - - - -	25	
Interest on $25, 10 per cent. risks included, - - - - -	2 50	
		$19 75
Profits of a cow, - - -		$18 84

It is understood, that no extra feed is, in this case, given to the cow; and the butter and milk used in the family, it is supposed, will fully pay for the attendance. This is a fair profit; but it is, as I think, we shall presently see, much less than it should be. No animal is better entitled to good keeping than a cow; because none makes a more liberal return for all the extra kindness and feed and attention bestowed on her.

In another dairy, nine cows made 1650 lbs. of butter, and 300 lbs. of cheese.

Another dairy of twenty cows produced, of butter, 500 lbs.; of new milk cheese, 4000 lbs.

In this town, two acres of land are deemed sufficient for pasturing a cow or fatting a steer. Twenty head of cattle, made up of cows and three year old steers, were fatted upon thirty acres of land.

The subject of dairy-produce is of such importance, that I shall give various returns and calculations. I omit names; I should be glad to give them, and in a majority of cases it might not be disapproved; but a fear of giving offence, or of being thought to take an improper liberty, or of interrupting that freedom of communication, which I wish should subsist between myself and the farmers, and which seems indispensable to the success of the survey, induces me to withhold them, save where permission has been explicitly granted, or the nature of the case renders it obviously proper. The statements, which I give, rest upon undoubted authority.

2. In *Otis.*—Twenty cows gave 5000 lbs. new milk cheese, for sale; each averaging also 25 lbs. of butter; 600 lbs. of cheese were also used in the family.

Cow, Cr.

280 lbs. cheese, at 8 cts., - - - -	$22 40
25 lbs. butter, at 20 cts., - - - -	5 00
Calf, - - - - - - - - -	4 00
Pork, 26 lbs. at 6 cts., - - - - -	1 56
	$32 96

Cow, Dr.

Wintering, - - - - -	$12 00	
Pasturing, - - - - -	5 00	
Interest on cost of cow $15—10 per cent., - - - - -	$1 50	
Labor and attendance, - -	2 16	
		$20 66
Balance in favor of cow,		$12 24

3. *Lanesboro'.*—Sales from 12 cows: cheese at 12 cts.; butter at 25 cts.; gross amount, $600. No account in this case is made of supplies in the family.

4. *Sandisfield.*—The average yield of a cow in ordinary seasons is rated at 250 lbs. with common keeping. By extra keeping, the quantity is increased to 350 or 400 lbs. The quantity of butter in addition, to each cow is supposed to be from 40 to 50 lbs., where new milk cheese is made.

The amount of cheese made in Sandisfield, in 1837, was estimated by a most competent authority, at 300,000 lbs.

Another farmer, with a dairy of 15 cows, states the average product of a cow, if she raises her calf, at 250 lbs.; if otherwise, 300 lbs.; and 25 lbs. butter also, from each cow. Four hogs may be kept to 20 cows. In this way, weighing 100 lbs. in the spring, they will weigh 300 lbs. in the fall. 140 lbs. of pork is to be credited to 5 cows.

The cost of wintering a cow here, is rated at $10; pasturage, $4.. A good dairy woman will take charge of thirty cows, with assistance in milking and in handling cheese. Her wages will be $1 50 per week, with board.

5. In *Tyringham*, the average yield of a cow is reckoned at new milk cheese, 283 lbs., and butter at the same time, 57 lbs. A dairy of 28 cows gave 7912 lbs. new milk cheese, and 1600 lbs. butter. A large amount of pork was fatted on this farm; but it is difficult to say what portion of it is to be credited to the dairy.

6. In *Sheffield*, the average product of 28 cows was 394 lbs. new milk cheese, and 50 lbs. of butter each.

The product of a cow is thus stated by this excellent manager:

Cow, Cr.	
400 lbs. new milk cheese, at 8 cts., -	$32 00
Calf, (killed at three days old,) - -	1 00
50 lbs. butter, at 16⅔., - - - -	8 33
Whey and butter-milk, make one hundred lbs. pork, - - - - -	8 00
	$49 33
Supra, Dr.	
Winter keeping, - - - - -	12 00
One acre of land costing $50 will pasture the cow, - - - - - -	3 50
Salt 25 cts., 3 bs. bran $3, - - -	3 25
Int. on the value of cow at $25, 10 per ct.	2 50
Labor of milking, making butter, cheese, &c., - - - - - - - -	4 00
	$25 25
Balance in favor of the cow, - -	$24 08

The quantity of land estimated for pasturage in this case seems small. It must be small for a general rule; another farmer in the same town assured me that he kept one yoke of oxen all the season, and one horse half the season, on two and a half acres of land, which he showed me. The land had been greatly benefited by plaster.

7. In *New Marlboro'*, the yield of a cow is estimated at 300 lbs. new milk cheese; 4 hogs are kept to 20 cows; 2 tons of hay are deemed requisite for a cow; value of hay sold $10; but if the farmer can realize $6 per ton for it used on the place, he deems it better than to sell it. Eight to ten acres of land here, with the use of plaster, is deemed sufficient for the pasturage of four cows.

8. In *Great Barrington*, 9 cows produced 1900 lbs. new milk cheese and 800 lbs. butter. In another case from 8 cows were sold of butter 200 lbs., of new milk cheese 1225 lbs. In another case 5 cows through the season, and an additional cow half the season, from 1st. June to 10th Nov., produced 651 lbs. butter; and 200 lbs. new milk cheese. In this case the weekly returns were given. The same farmer says, that his cows will average one pound of butter per day through the season. He states his cow account thus:

Cow, Cr.		
200 lbs. butter at 20 cts., -	$40 00	
Calf raised, - - -	2 00	
Butter-milk, and skim milk for pork, equal to all the care,		
	$42 00	
Supra, Dr.		
Wintering, 2 tons of hay, -	$16 00	
Pasturing, 25 cts. per week, 26 weeks, - - - -	6 50	
Int. on cost of cow $20 at 10 per cent. - - - -	2 00	
		$24 50
Profits of a cow, - - -		$17 00

9. In *Alford*, the actual yield of a cow was as follows:

Butter, 240 lbs. sold.

Cheese 100 lbs. do., besides using what milk and butter were required by two persons. She had her own skimmed milk, but no meal or grain. She consumed, as ascertained, two tons of hay; and her pasturage was 25 cts. per week.

10. In *West Stockbridge* the report given is 300 lbs. new milk cheese to a cow; $40 are often obtained from a cow; $30 are deemed an average yield.

11. In *Stockbridge*, the proceeds of a dairy of twenty cows are thus given:

20 cows. 4000 lbs. new milk cheese sold at 9½ cts., - - -	$380 00
1000 lbs. skim milk cheese sold at 6 cts., - - - -	60 00
600 lbs. butter, sold at 9½ cts.,	150 00
	$590 00

This gives $29 50 cts. to a cow.

No account is made in this case of the supplies of the family, nor of the amount of pork fatted, both which items would greatly have increased the result.

12. In *Lenox*, the return of a dairy of 15 cows, was of new milk cheese 1200 lbs.; of butter 1800 lbs.

The return of another dairy is as follows:

10 cows produced of butter 1120 lbs. 8 oz., sold at 18 cts., - - -	$201 69
" " cheese, 800 lbs. sold at 9 cts., - - - -	72 00
	$273 69

13. *Tolland.*—From a highly intelligent farmer in a town adjoining the county, Tolland in Hampshire co., I received so particular an account of a dairy, that I shall here insert it though it might be thought to come more properly under the report of another county.

15 cows produced 4500 lbs. cheese, sold at 9 cts. per lb. - - - - -	$405 00
and 509 lbs. butter sold at 19½ cts. - - - - - -	99 25
	$504 25

Fifteen cows will nearly fatten 4 hogs, weighing in the spring 20 lbs. each; in the fall, 240 lbs. each. In this case it is deemed proper to credit the milk with 140 lbs. weight of each of these swine; 140 lbs. + 4 are equal to 560 lbs. pork at 8 cts. = $44 80—this divided by 15 gives to each cow a credit of $2 98⅔ cts.—

Butter and cheese 504 25, add pork 44 80=549 05.

The proceeds of each cow is $36 60⅓—

add calf and rennet $1 00, $37 60⅓, $37 60⅓

Expenses.

Wintering a cow, usual charge, -	$9 00
Pasturing do. $6 50, salt 50 cts.,	7 00
Interest on the value of a cow $23 at 10 per ct. - - - - - - - -	2 30
One woman will manage the milk of 30 cows,	
Her wages $1 50 per week, 28 weeks, her board $1 per week	
Wages and board for a dairy of 30 cows would be $70, or $2 33 each, -	2 33
Additional help in milking and turning cheese 67 cts., - - - -	67
	$21 30
Profits of a cow, - - - -	$15 30⅓

No account in this case was taken of the butter and milk used in the family; but supposed to be not less than 150 lbs. of butter.

14. *Cheshire* is devoted almost exclusively to the dairy husbandry; and has been celebrated for the excellence and abundance of its produce. For the goodness of their cheese, however, I must rely upon authority. Its appearance in some of the dairies, which I examined, bespoke careful, neat, and skilful management.

A farmer with 25 cows, states their average yield at 300 lbs. cheese, and 20 lbs. butter to a cow. He says likewise that 1500 lbs. pork are to be credited to his cows.

The average cost or value of his cows is $30 each; wintering $14; pasturing 26 weeks, $6 25; he raises some calves upon whey. It requires the whey of two or three cows to raise a calf. His hogs at 18 mos. average 350 lbs.; they run in a pasture and have the refuse of the dairy until about six weeks before it is intended to kill them, when they are shut up and fed with corn and meal. A shrewed farmer observes, that, where swine in this way run in a pasture, it should be laid down as a rule, to have their trough always wet or always dry. This means that they should have as much whey as they are disposed to eat; or, by being kept wholly without any, they should from necessity get their living in the pasture. They require quietness of mind and freedom from restless desires in order to thrift; and they are like other epicureans whom variety and abundance render fastidious.

The dairy of another farmer consists of 20 cows. The year before last they yielded 400 lbs. new milk cheese; the last year 400 lbs. each, besides an ample supply of butter for the family. He calculates upon the proportion of one hog to four cows; with the above cows he made 1200 lbs. of pork, 600 lbs. of which he credits to the cows; he deems three acres necessary for the pasturage of a cow. His cows during the spring, have an allowance of rye meal and whey.

In another case the produce of 23 cows was 12,000 lbs. new milk cheese, and 500 lbs. butter.

Another case from 11 cows including 4 three-year-old heifers, there were sold and used 3475 lbs. new milk cheese, and 403 lbs. butter. Three hogs were likewise fatted; and it was considered that 400 lbs. pork were to be credited to the cows. Two tons of hay were required for the wintering of a cow, valued at $8 per ton; or she might be kept for hire at 50 cts. per week.

In another case 30 cows made 14,000 lbs. new milk cheese; and 500 lbs. butter. In this case some calves were raised; but most of them were killed at four days old. Throughout the county of Berkshire this mode of dealing with the calves is termed "deaconing" them. What is the particular propriety of this provincialism, I am unable to determine; and whether it had its origin in any superstition among the aborigines or the first setlers of the county, I shall leave to the antiquarians to accertain. It is a peculiarity, and prevails no where else.

The practice, with this farmer, is to give boiled corn in the ear to his cows; perhaps a dozen ears to a cow per day. When it is conveniently had, he gives a mess of rye meal to each cow, at the rate of two quarts per day, for three weeks in the spring. He is anxious to let his cows go to the grass as soon as the ground is bare. He thinks cows are liable to suffer from excessive feeding in the barn.

The wintering of a cow requires 1¾ ton of hay, - - - - - -	$14 00
Pasturing, 20 cents per week for 26 weeks, - - - - -	5 20

In 40 days of the best of the season on this farm 30 cows produced 4000 lbs. butter. The land required for the pasturage of a cow is considered to be three acres.

From thirty cows, an average of 425 lbs. of cheese has been produced to each cow, and ten lbs. of butter; or 300 the whole.

On one farm, where 18 cows were kept, 11,385 lbs. new milk cheese were made in a season, which gives the extraordinary average of 632½ lbs. to a cow. 200 lbs. of butter were made the same season from the same cows. One of these cows produced 1000 lbs. new milk cheese.

During the first part of the season, for two months, two quarts of rye-meal were given to each cow. Half of this quantity of meal was given them for one month during the last of the season; and the greater part of the time they had their whey. 100 lbs. pork were made on the farm; and half of this was credited to the cows.

The same individual, when on another farm in South Adams, with twenty-one cows, made 626 lbs. new milk cheese to a cow, in a season. 1700 lbs. of pork were raised in connexion with the dairy. Half the pork was considered due to the cows.

The process of making cheese began the 25th April, and ended the 1st December. As soon as the cows calved, the cows received three quarts of meal per day each—principally rye, with some Indian; and each had some whey, though not half what was yielded was given to them. Three or four of the cows received meal all the summer. He commenced feeding again with meal on the 25th July, and continued to give them two quarts of meal until the 25th of August. On the 25th of August, he began feeding the cows with corn-stalks until 10th September. Then the cows had the after feed of the fields; and from the 1st October, these cows had half a load of pumpkins per day. In November, fed every cow fully with meal; two and three quarts per day until 1st December. After that, the cows had nothing but hay until spring. From the same cows, at the same time, butter enough was made, and milk enough used, for a family of six persons. The cheese sold in New York for $10 per 100 lbs.

These products are certainly remarkable, and show what may be done by attention, skill, and good treatment of the animals under our care. The pasturage in Cheshire is of an excellent description. The soil is generally of a rich gravelly loam resting upon lime-stone, and abounding in vegetable mould. It is likewise sensitive to the application of plaster, which is very commonly used.

From the Genesee Farmer.

REPORT OF THE COMMITTEE OF THE NEW YORK AGRICULTURAL SOSCIETY ON ROOT CULTURE.

The committee appointed at the last meeting of the Society, to "report on the best vegetable or root crops for feeding cattle, and the best means of cultivating the same," report as follows:—

The culture of roots, as farm-crops, for feeding and fattening domestic animals, is of such recent introduction, and so limited, among us, and the few experiments that have been made, to ascertain the relative value of these roots, have been so loosely managed, that the committee do not possess the data that they could desire, to make a satisfactory report, adapted exactly to our practice. But they are nevertheless satisfied, from the numerous experiments which have been made in Europe, in a climate very similar to our own, and from the partial ones which have been made among us, that the culture of roots is destined to effect here, what it has effected elsewhere, a great and salutary change in husbandry, not only as furnishing the easiest and cheapest means of feeding and fattening domestic animals, but as an important source of fertility to the farm, and of securing the main point—ultimate profit, to the owner or cultivator.

Under these strong impressions of the advantages of encouraging and extending root-culture, your committee proceed, with the limited means at their command, to fulfil the duties assigned to them by the society.

The Highland Agricultural Society of Scotland, have recently awarded liberal premiums for experiments in fattening neat cattle; *first*, upon different kinds of roots, as the potato, turnip, and mangel wurtzel; *second*, upon raw and cooked food; and *third*, upon roots entirely, and a mixture of roots, grain, pulse and oil-cake. These experiments have been made with a view of accurately ascertaining the comparative value of each kind of root and other food, and the economy of each mode of feeding it. The experiments have been numerous. They have been upon ten to thirty head of cattle at a time; and they have been continued from three to six months. The animals were weighed or measured at the time of starting the experiment, at the close of it, and generally at intermediate periods, particularly when the food was varied; and the quantity of roots and other food given was accurately noted—so that the result has indicated the relative value of each kind of food in the fattening process, and the best mode of feeding it. The committee proceed to state, in a summery way, the results of some of these experiments.

1. *The relative value of different roots.*

Mr. Howden, with a view to the experiment, set apart the product of two acres of mangel wurtzel, amounting to fifty tons; five acres of Swedish turnips, being 140 tons; and two acres of potatoes, weighing 29 tons 4 cwt. The experiment was made with 21 head of cattle, which received, in addition to the roots, a few distillers' grains and a little straw. The following table shows the roots appropriated to each lot, and the monthly increase of the animals in girth. The abstract is made from the prize essays of the society, which cannot now be referred to; but the impression is, that in all the experiments which we quote, the roots fed to each lot were precisely the same in weight. Lot No. 1 was fed from the product of one acre of potatoes, one acre of mangel wurtzel, and one acre of Swedish turnips; No. 2 from one acre of potatoes and two acres of Swedish turnips; and No. 3 from one acre of mangel wurtzel and two acres of Swedish turnips.

Date.	Lot No. 1.	Lot No. 2.	Lot No. 3.
1831, Nov. 30,	35 ft. 8 inches	35 ft. 9 inches	35 ft. 8 inches
Dec. 30,	36 " 6 "	36 " 7 "	36 " 6 "
1832, Jan. 30,	38 " 2 "	38 " 4 "	38 " 2 "
March 1,	39 " 7 "	39 " 8 "	39 " 6 "
" 30,	40 " 8 "	40 " 10 "	40 " 6 "
April 30,	41 " 4 "	41 " 7 "	41 " 3 "

Twenty-eight tons of mangel wurtzel and Swedish turnips were withdrawn to feed other stock.

On the 30th January Mr. Howden took a pair of cattle out of each lot, and fed No. 1 with potatoes and water, No. 2 with Swedish turnips, and No. 3 with mangel wurtzel. The following shows their relative increase in three months.

Date.	Lot 1. Potatoes.	Lot 2. Swed. turnips.	Lot 3. Man. wurtzel.
1832, Jan. 30,	10 ft. 8 inches	10 ft. 5 inches	10 ft. 4 inches
April 30,	11 " 6 "	11 " 3 "	11 " 2 "

When the cattle were sold, the purchasers agreed that the lot fed on Swedish turnips were from 7s. to 10s. ($1.54 to $2.22) a head better than the other lots. The average advance upon the original value of each, was £6.12, and the cost of the grains being deducted, there remained £120 ($532.80) in return for the eight acres of produce consumed, or $66.60 for each acre.

From the above statement it would seem there is no great difference in the fattening properties of the three kinds of roots; and that so far as measure or weight is concerned, it matters little which were employed in feeding. We will note here for future reference, the product per acre, of each kind of roots, upon Mr. Howden's ground, adding the product in bushels of 56 lbs.

The potatoes gave 12 tons 4 cwt. equal to 288 bushels.

The mangel wurtzel 25 tons equal to 1000 bushels.

The ruta baga 28 tons, equal to 1,120 bushels.

2. *The comparative economy of feeding raw or prepared food.*

In 1833 the society offered a premium of 30 sovereigns for the best report, founded on actual experiment made for that purpose, on a number of oxen or heifers, not fewer than six, the animals to be of the same breed, age and sex, and the term of feeding not less than three months. Several reports were received and published in 1834. From these we abstract the following:

Mr. Walker made his experiment with six two year heifers, and four two year old steers. Each parcel was divided into two lots, and fed on like food, except that one half received their food raw, and the other half in a steamed or cooked state. The food consisted of Swedish turnips, potatoes and crushed beans, with a little salt and straw. At the end of three months, it was found that the three heifers fed on steamed food had gained 48½ stone, or 679 lbs., and the three heifers fed upon raw food had gained 45½ stone; but the quantity consumed by the first lot exceeded that of the latter.

Cost of feediug on steamed food,	£14 1 3
" on raw food, - -	10 8 7½
The first cost more than the last,	3 14 8½

Deducting the first cost, and the price of fattening from the price paid by the butcher, there remained a profit on the three heifers fed with steamed food, of 9*s*; while the profit on the three fattened with raw food, amounted to £3 10*s* 6*d*. By a like estimate, the loss on the steers fed with steamed food was 3*s* 8*d*. and the profit on those fed with raw food 10*s*. 6*d*.

Andrew Howden made a like experiment with 18 cattle in six lots. Their increase and expense of keeping for three months, from the 20th March to the 20th of June, were as follows:

	Incr. in lbs.	*Expense.*
Three heifers on raw turnips,	392	£6 18 0
" on steamed turnips,	532	8 18 0
" on raw potatoes,	600	10 7 0
" on steamed potatoes,	572	10 7 0
Three steers on raw potatoes and corn, - -	722	9 4 0
" on boiled potatoes and corn, - -	689	9 5 0

John Baswell fed ten horned cattle. The expense of keeping the five cattle on raw food was £32 2 1, while that of the cattle on prepared food was £34 5 10. On being slaughtered the two lots appeared to be very similar, but the particular weight is not mentioned·

3. *Relative economy of feeding with turnips alone, or with turnips and other more expensive food.*

Robert Stevenson was the successful competitor for the society's premium. He took 18 oxen; their live weight was ascertained at the beginning, at the end, and at intermediate periods of the experiment, which continued 119 days. The cattle were divided into three lots of six beasts each, and a correct account was kept of the weight of food consumed by each lot. Lot 1, was allowed linseed cake, bruised beans, and bruised oats, in addition to turnips, and during the last 24 days of the experiment, 20 lbs. of potatoes were given per day to each. Lot 2, received the same allowance except the linseed cake and half the potatoes. And lot 3, was fed upon turnips alone. The cost of the keep of each animal, during the 119 days, was as below:

Total cost of feeding one beast of lot 1,	£5	2	7
do do do of lot 2,	3	17	0
do do do of lot 3,	1	18	7½

The improvement in live weight was as follows:

First lot increased in weight		108	stone.
Second	do do	101	"
Third	do do	49	"

Abstracting the cost of feeding from the value of the increased weight, the loss and profit would stand as follows:

Loss on feeding lot 1, - -	£3 15 8½
Profit on feeding lot 2, - -	1 19 3½
Profit on feeding lot 3, - -	2 11 1

"Thus, when turnips alone were used, a profit of twenty-two per cent was realized; where beans and oats were used along with the turnip, the profit was diminished to eight and a half per cent; but when still more expensive food was tried, that is, grain and linseed cake, along with turnips and potatoes, a loss was sustained of no less than 12 3—16 per cent."

Lot 1, were the largest oxen. They were fed each with 132 lbs. per day of Swedish turnips; lot 2, were fed each with 120 lbs. of the same per day; and lot 3, being the smallest, received but 115 lbs. per day, and for twenty-four days, but ninety-two pounds.

Lot 1, cost 4,484 pence for every lb. of increased live weight.
Lot 2, " 3.92 " " "
Lot 3, " 3.39 " " "

The turnips were estimated at four pence per cwt; the potatoes at 1*s*. 6*d*. per cwt.; oats and beans at 3*s*. 6*d*. per bushel, and linseed cake at three-fourths of a penny per pound.

"In conclusion" says Mr. Stevenson, "on this part of the subject, "we give it as our opinion, that whoever feeds cattle on *turnips alone*, will have no reason on the score of profit, to regret their not having employed more expensive auxiliaries to hasten the fattening process."

It would seem pretty evident, from the forgoing experiments, that ruta baga and mangel wurtzel are the best root crops for feeding cattle. The profit of cultivating and feeding these roots will be more manifest, if we compare their acreable product with that of hay, potatoes, and the coarse grains which we feed for fattening animals. To enable the committee to make this comparison, they assume the following as the average products of crops, and attach to each of these an estimate of their marketable value. Both the product and the prices will greatly vary; but those assumed are deemed sufficiently correct for comparison.

An acre of grass,	2	tons at	$10		$20 00
do corn,	40	bush. at	75	cts.	30 00
do oats,	30	do at	37½	"	11 20
do buckwheat,	30	do at	50	"	15 00
do potatoes,	150	do at	25	"	37 50
do ruta baga,	600	do at	25	"	150 00
do man. wurt.	600	do at	25	"	150 00

Estimating the cost of the roots in labor, at twenty dollars an acre more than that of the hay, oats and buckwheat, it still leaves a great disparity in the profits; and considering the cost of culture equal to that of Indian corn, there is a manifest advantage in the turnips and mangel wurtzel over the corn-crop, as a material for cattle food. Good beef cannot be made on hay alone, in winter; and those who do not feed roots, must resort to some more expensive food, as the meal of Indian corn, oats, buckwheat, &c. The turnips and mangel wurtzel, on the contrary, with the aid of perhaps a little straw, will serve themselves to feed and fatten animals.

In this matter the chairman can speak from experience. He purchased four oxen a little before Christmas, and kept till some time in April; after a short time, they ate each two bushels a day of ruta baga—they would eat very little else, though laid before them, not even linseed cake. They made good beef, and afforded a handsome profit on the turnips consumed.

If we now assume that an ox will require a quarter of a hundred of hay per diem to keep him in good condition, and that it will require an addition of four quarts of corn-meal, or eight quarts of chrushed oats of buckwheat, per diem, to fatten him; and if we consider 112 pounds or two bushels of roots equivalent to a ration of hay and grain, then the several crops will feed an animal as below.

One acre of grass, and half an acre of corn will feed - - - -	160 days.
One and a half acres of mangel wurtzel, or Swedish turnips, will feed -	450 days.
One acre of grass, and one acre of oats or buckwheat, will feed - -	160 days.
Two acres of Swedish turnips or mangel wurtzel will feed - -	600 days.
One acre of potatoes will feed -	75 days.
One acre of Swedish turnips or mangel wurtzel will feed - - -	300 days.

Making very liberal allowance for the difference in the expense of raising these crops, and for any error the committee may have made in fixing the daily rations, or in the acreable produce of each, they think that no doubt can for a moment be entertained that the Swedish turnip and the mangel wurtzel are decidedly the best crops that can be raised for feeding and fattening cattle.

The committee have no doubt that the sugar beet and the carrot offer advantages nearly or quite equal to the roots above recommended. Their product and nutriment properties are very similar, and the expense of culture is not very dissimilar. The sugar beet is probably richer in nutriment than the mangel wurtzel, though its product is ordinarily less. The carrot may require more labor in the culture; but it is superior as food, particularly for horses.

Arthur Young highly extols the carrot. Upon the product of three acres of this root, he assures us, he kept for more than five months, twenty work horses, four bullocks, and six milch cows; nor did the animals, during that period, he adds, taste any other food, except a little hay. Our enterprising fellow-citizen, Col. Meacham, of Oswego, has gone largely into the culture of carrots, as cattle feed, as well as many of his neighbors; and they speak highly of the profits of the culture.

Some highly satisfactory experiments have also been made among us, on a limited scale, in cultivating and feeding the sugar beet. There seems to be little doubt, from the high state of perfection and of profit, which the business has arrived at in France and Germany, that the culture of this beet will soon be extensively gone into in this country, for the purpose of making sugar; and if so, the residuum of the beet will form an important item in the material for fattening cattle.

There are other advantages resulting from root-culture which should not be overlooked. It tends greatly to increase the quantity of manure on the farm, to meliorate the texture of the soil, and to furnish excellent alternating crops in convertable husbandry. In selecting for culture, the farmer should chose the roots that are best adapted to his soil. The turnips prefer a dry sandy soil; the beet a clay loam.

As to the best means of cultivating these crops, the committee summarily remark, that the product and profit will materially depend upon the following contingencies, viz: that the soil be dry; that it be rich; that it be deeply worked; that it be well pulverized; and that the after-culture be well managed. The implements necessary to cultivate them advantageously, in addition to the plough and harrow, are the drill-barrow and cultivator. The season for sowing the beet is from the 10th to the 20th May; of sowing the Swedish turnip, from the 10th to the 25th June. The drill or row-culture is decidedly the best. A detail of the whole process of culture would occupy too much space for this report, and is unnecessary, as these processes are already understood by many, and have been minutely described in the agricultural periodicals of the day. The committee will merely recommend in conclusion, that the roots be always cut, previously to being fed to cattle, for which machines may be procured, at a moderate charge, which will cut a bushel in one to three minutes. If cut, the roots are eaten entirely: if not cut, a portion is apt to be rejected and wasted.

The chairman has received a communication from Col. Meacham, stating his mode of cultivating carrots, the product, and manner of using the crop. He cultivates them in drills, from 20 to 24 inches apart—he gets one thousand bushels an acre, at an expense of $25 to $30; he kept six work horses on them from Nov. 1836 to June 1837, without grain, and they remained in good plight, and performed as well as he ever had horses to perform—and he thinks they are worth double as much for stock as ruta baga.

Upon the subject of the carrot-culture, which is perhaps less understood among us than that of the beet and turnip, the committee will add, that this root thrives best in a sandy loam, light, moist, but not wet, and of great depth; in which the plough, going to the beam, brings to the surface nothing that is not fit for vegetation. The ground should be ploughed immediately preceding the sowing. In Suffolk, Eng., they sow 8 lbs. seed, broadcast, to the acre; and the crop is from 400 to 500 bushels. To horses they are considered superior to any other food. Two bushels of carrots and one of chaff is the per diem allowance to a horse; or 7 bushels of carrots and one bushel of oats is the allowance for a week. They are also profitably fed to all other farm-stock. They are raised in Suffolk without dung, at an expense of 9*d.* (16 cents) per bushel. The yield of the carrot is often 700 to 1000 bushels the acre. The crop is gathered by making a deep furrow near to the drill, when a man seizes, draws the top to the furrow, and pulls them up with great facility.

Another root, the parsnip, is deserving of notice, though its partial culture hitherto, will hardly entitle it to be classed among field crops. It is believed to be the most nutritious root of any that have been named; is as easy cultivated as the carrot or the beet; and has this advantage over all the others, that its value is not impared by frost.

From the preceding views, the committee do not hesitate to recommend the extention of root-culture, as the most ready means of keeping up the fertility of our farms, and of increasing the profits of their cultivation. J. BUEL, *Ch'n.*

ALLEGED EFFECT OF SLAVERY ON THE AGRICULTURE OF VIRGINIA.

To the Editor of the Farmers' Register.

Portsmouth, Va., April 1, 1839.

You have indeed, from all accounts, a vast and fine tract of country, from 60 to 80 miles broad along the whole Atlantic coast. This vast country is now, in a good measure, a desert, or covered with forests—the land ruined by continual cropping, and now deserted. Good lands, as I am told, may now be obtained in this vicinity for from $5 to $8 an acre, in part covered with a young and luxuriant growth. We know the causes of this destruction; and these same causes continuing, it seems not very probable that these lands will ever again be recovered, or rise in value until those causes are removed.

It appears to me that the soil answers well to the description of the soil of Flanders, which is said to be, now, the garden of the world, though formerly it was very poor; and I am fully satisfied that the whole of eastern Virginia, with suitable management, by clearing and draining, may become, one day, not only the most healthy country, but the garden of all the Atlantic states. The lands in this vicinity, as far as I have seen, appear to be at least as fertile as any of those lands of Massachusetts, which now bring $100 an acre. Larger crops by far, as I am fully convinced, may be obtained from these lands, at far less expense than are obtained on many of the best lands in Massachusetts.

Your state contains, as I believe, 44,000,000 acres of land, and, I am satisfied, capable of sustaining a population of from 8 to 10,000,000. Your treasures of calcareous manures, for the renovation of these lands, are inexhaustible, and are profusely scattered over the whole country, far and wide. This is not the case in a very considerable portion of New England. But one great objection with many of our northern men to a permanent residence in this country, is the state of slavery that here exists. For slavery in Virginia not only has a tendency to lower and degrade the wages of the free laborer, but to degrade also the profession. It is not thus in New England, but the reverse—idleness being deemed in that country a vice, and useful labor honorable in all. This state contains about 500,000 slaves, which are probably valued by their owners, one with another, at $400 each, or $200,000,000, for the whole. Now, can any one doubt but that if all these slaves were emancipated, that the lands of Virginia would rise $5 an acre, and this rise of $5 an acre would be equivalent to the estimated value of all the slaves. I am persuaded, however, that the rise of lands would be far greater; and that, were all the slaves emancipated at this day, the state of Virginia would experience a clear gain of more than $500,000,000 in the rise of their lands alone. Emigration would then take place to a great extent from the northern *free states*. The Yankees would then flock hither, and hire up at advanced wages the freed slaves, and the whole of eastern Virginia would then become a perfect garden. The advantages of this part of Virginia for the production, especially of all *early vegetables* and *fruits* for the supply of the markets of the great cities of the northern and middle states, is very great, and unrivalled; as these cities, by the aid of rail-roads, and steam navigation, will soon be brought within 24 hours of Norfolk; yet the seasons are at Portsmouth full a month in advance of some of these northern cities. The wheat of lower Virginia almost always commands a higher price than that of the north, new flour being preferred by all. The fields of Virginia may be reaped and the produce converted into flour, and this flour for sale at New York and Boston, even before the wheat fields of the north are ready to harvest.

Although the prices of provisions are generally at least as low in this part of Viginia, and the price of labor much lower than in New England, yet I am inclined to believe that this difference in regard to wages is rather nominal than real; since the expenses of fare and of entertainment to the traveller are far greater on the main travelling routes of the south, so far I have seen, than they are in New England. I am persuaded that the people of Virginia will never be able to compete with their brethren of the less highly favored land of New England, either in agriculture, or manufactures, or commerce, until some great change, under providence, can be brought about in the political condition of their people.

I have written to some of my northern friends, and aver that an experienced northern farmer might here make a great fortune suddenly in the cultivation of *early* productions for northern markets, which there command a most extravagant price. Your horses and cattle are generally lean and poor; but this, I am confident, is owing not to climate, but to want of shelter and bad keeping, want of attention and care. My horses, from Baltimore, owing to good care of my Yankees, are in the finest possible condition; so those of the Navy-yard here, although I am told some of those horses are now old. Very respectfully,

WILLIAM KENRICK.

EDITORIAL REMARKS.

All of our northern readers, as well as some of those in the southern states, may be surprised that the foregoing condemnation of slavery should have been admitted to our pages. The former, probably, suppose that southern men and slave-holders fear, and therefore object to, the expression of opinions contrary to their own on this subject; and many in the south, in their violence against northern anti-slavery fanaticism, show themselves to be as bigoted and fanatical in opposition, and are disposed to regard any expression of such opinions as both insulting and designing injury to themselves. But we are not of this class. Maintaining as we do, and as staunchly as any can do, the rights of slave-holders, both private and political —maintaining too, that the institution of personal slavery, under certain circumstances, (and which are in full operation in the greater part of the southern states,) is politic, and proper in itself—maintaining too, that the institution, in general, has been highly beneficial to the world, in increasing labor, wealth, civilization, and refinement, and even in spreading good morals and religion—still, we neither object to others considering these opinons as altogether erroneous, nor to their endeavoring, by argument and evidence, to sustain their opposite opinions. Domestic or personal slavery, even upon our own view, like every other wide-spread and widely operating institution, has its evil as well as its good effects; and in regarding it, perhaps we may allow too little weight to the former, and too much to the latter—just as we deem that our northern correspondent errs in the opposite manner. But no matter how erroneous may be his views, and those of his countrymen in general, on this subject, it is always well for us to learn and know the opinions of intelligent and observing strangers concerning what they may suppose to be both the good and the evil of our agricultural condition. Their correct views will do us good—the incorrect will certainly do us no harm.

Mr. Kenrick is is a nursery-man of extensive business near Boston, and the author of several agricultural and horticultural works, (the 'American Orchardist,' 'American Silk-Grower's Guide,' &c.) Until receiving the foregoing letter, the last correspondence which we had had with him occurred more than three years ago, when he wrote to ask our advice as to a then novel scheme of his, for establishing his nursery for the morus multicaulis in lower Virginia, instead of on his own land, and under his own personal direction, in Massachusetts. His inducement, stated in his letter, was that he knew that the growth of the multicaulis of one season in our climate, was equal to that of three, or perhaps more seasons in Massachusetts. We concurred in his views, urged his carrying them through, and gave such information as could be offered in aid of his plan. But we further urged on him to extend it to the establishment of silk-culture in Virginia, and gave such views for it, as have been often stated in the Farmers' Register, as sufficient inducements to invite northern silk-culturists to settle here. As a stronger inducement for an establishment, which we even then thought so desirable, both for public and private interests, in Virginia, we offered, in the same letter, to sell to him, or to a company formed for the purpose of making silk, a marled farm of 600 acres of land, and to vest the purchase money in the joint stock of the adventurers. We quote from memory, but believe with no material variation from the substance of the letters; and the opinions then so expressed, and the investment which we were then (in advance of all other adventurers in Virginia) ready to make in silk-culture, *if some practical and experienced culturists would undertake the management*, may serve as strong proof, in addition to others of another kind recently adduced, that we have long and earnestly advocated the advantages of silk-culture in this region, and would have risked much of our property on the soundness of that opinion. It should be observed, that at that time no one anticipated the multicaulis speculation, and the enormous prices which have since been obtained—or counted on profits from so strange a circumstance. For our own part, we had not then the slighest expectation of ever selling a plant from the silk-farm then proposed to be established; and Mr. Kenrick, in his scheme, probably counted on merely making the usual sales and profits of that branch of his general nursery business, to be increased in product and amount, however, by his availing of our more genial climate. To that operation he limited his following of our advice; and though at the end of two years, he sold plants (as we have heard from other authority,) from a few acres of land near Richmond, for $30,000, that enormous profit was a result beyond all previous calculations, and for which we claim no credit in having encouraged the scheme by our advice. As we failed in inducing the commencement of silk-culture as the main object, we cared nothing about the mulberry culture alone; and did not then set out a single plant, nor until a year afterwards, when it was caused by accident, and not by design, or by calculations of profit.

It was under these circumstances that Mr. Kenrick became a cultivator to some extent in Virginia, though still continuing a resident of Massachusetts; and we have thought that the statement, though a digression, might be interesting and useful, as exhibiting, in a strong light, the practical proof of the superiority of our climate. For the adventurer has not only labored under all the disadvantages of remote residence, but also under those caused by his prejudices against the facilities offered by our cheapest and best labor.

Mr. Kenrick is altogether mistaken as to slavery being the cause of the admitted agricultural degradation of the fine region near Portsmouth and Norfolk, and, in a less degree, that of lower Virginia generally. The holding of slaves doubtless in some manure helps to produce the general result, just as the facilities for comfort, ease, and rich products of land and labor, so abundantly offered to our countrymen by other circumstances, all tend to lessen exertion, and to make us indolent and careless. This is but according to the nature of man; and if there were not a slave in Virginia, there would still be so much more ease in acquiring the bare necessaries of life (and, on the seaboard, many of its luxuries also,) that our people would, in labor and frugality, still be far behind the crowded people of Massachusetts, who, on a rocky and barren soil, and under a rigorous climate, must both toil and save incessantly—or starve. It is because necessity does not drive, that perhaps *on no one farm in Virginia* is there so much economy of means, and of expenditure, as is *general in the north*. But in other respects, there is as well planned, and as skilfully executed agricultural practice, and altogether *far better farming*, in Virginia, than in Massachusetts. It is true that *good farming* is rare here; and so it is elsewhere. But it will surprise Mr. Kenrick to be informed that our best farming in lower and middle Virginia is always to be found in connection with, and absolutely dependent on, the most complete establishment and entire use of slave labor. We could name many farms in Virginia, of which the skilful and excellent cultivation, the system of improvement, and the general management, could not be deemed otherwise than admirable, even to a New Englander the most intolerant of and prejudiced against slavery; and we may add, though not bearing on our proposition, that these are generally the places where the comforts of the slaves are best cared for, and their condition is better than that of ninety-nine-hundredths of the free laborers throughout all other parts of the world. It may be true, on each one of these our very best cultivated and best managed farms, that a Yankee might pick up a comfortable income, and means for maintenance, in the matters regularly and continually wasted, and totally lost. But it may also be said, that without the cultivation and returns being very good, and there being much profit actually made, so much waste and loss could not be afforded. Even with all our admitted faults of system, and of execution, we feel assured, from such information as we have, that there are many farmers in Virginia who deserve to rank in their profession at least as high, if not higher, than the best in New England. Still, we yield the palm, and freely award the praise, to these our northern brethren, of greater economy in every thing, comprehending better habits of labor, and of frugality. But this latter difference, and superiority on their part, are owing to the difference of other circumstances--the greater pressure of necessity in the one case than the other, and not to the existence or absence of slavery. Nor do we mean to under-rate these highly valuable elements of agricultural success. On the contrary, we have continually admitted and applauded the superior merits of our northern countrymen in these respects, and recommended their example to be better followed here.

There are many circumstances which have concurred to depress the agriculture of Virginia, which we will not here stop to rehearse; and there is no part of the state where agricultural skill and products are lower, compared to the great natural advantages of the lands, than in the region in which Mr. Kenrick is now cultivating, and to which he more especially refers, in these respects. And if a number of his more industrious and frugal countrymen will come among us, and avail of the advantages which ours' so much neglect, we are confident that, either with the benefit, (or incumbrance, if so considered,) of slaves, or without, that they can even now make far greater agricultural profits than any where in New England.

If the capabilities of an agricultural region are to be estimated by its *worst* instead of its *best practices*, we might, perhaps, find even in Massachusetts, subjects for condemnation as great as any in Virginia; and grounds on which to pronounce the northern people as deficient as any elsewhere, in system, in judgment, and even in their peculiar and acknowledged merits of provident foresight and economy. We will quote, for example, a passage copied from the Survey of Berkshire by the Agricultural Commissioner of Massachusetts, which has just been published, and from which excellent report we shall copy sundry items of *good* husbandry, with much more gratification than we thus present defects for comparison and illustration.

"Yet with all this it must be admitted that the agriculture of the county in extent and productiveness is far below what it should be. As well as I could learn, Egremont is almost the only town in the county, which raises not only its own bread, but has some for exportation. Vast amounts of flour, grain of various kinds, pork and dairy produce are brought into the county from the neighboring states of New York and Vermont. It was asserted as a fact, and if so, it deserves notice, that two years since some families in one of the best towns in the county were without bread of any kind for a time, from the impossibility of obtaining it. They were persons for example who worked for the large wool-farmers. They asked for money for their labor; but money was not to be had, because the clipping of wool, owing to the derangements of business, had not been sold. They asked to receive their pay in grain; but the wool-farmers had abandoned all cultivation for the sheep husbandry. They asked for their pay in pork, but the farmers who raised no grain could raise no pork. Now whether this be a true history, or fabulous, it illustrates clearly the error committed in abandoning the production of grain."—*Second Report of the Agriculture of Massachusetts.*

If these facts had been stated, by a northern traveller, of a *cotton* instead of a *wool-growing* region, and of *slaves* instead of *free laborers*, what would have been the measure of severity of comment, both on the improvidence and the inhumanity of the farmers!

EXTRACTS FROM THE OLD LAWS AND RECORDS OF VIRGINIA.

(Continued from page 183.)

Sir William Berkeley's account of Virginia, in 1671.

The next extract presented, will be the entire copy of the "Enquiries to the Governor of Virginia, submitted by the Lords Commissioners of Foreign Plantations, with the Governor's answers to each distinct head." Hening says of this paper, that "a more correct statistical account of Virginia, at that period, cannot perhaps any where be found. The answers appear to have been given with great candor, and were from a man well versed in every thing relating to the country." Sir Wm. Berkeley was for thirty six years governor of Virginia, by royal authority, and exercised the power during that whole time, except the short intervals when dispossessed, first by the establishment of the English commonwealth's rule, and afterwards by Bacon's rebellion. The governor was an admirable specimen of the loyal cavaliers of his time. His entire devotion to his monarch, and submission to the regal will, had nothing in it of the *mercenary motives*, or crawling servility, of a modern courtier, or even of many a *republican* office holder, or office seeker, of our own time and country. His loyalty was founded in principle; and mistaken as the principle was, and misdirected to the basest of kings, Charles II, the feelings and motives yet command our respect, as much as those of the stern puritans who stood on the extreme of opposite ground. Berkeley's loyalty was like that so admirably depicted by Scott in the character of Claverhouse. Even amidst his expressions of loyal devotion to royalty in these answers, there may be discovered a proud and stern bearing, and scorn, which he scarcely cared to repress, for the measures of misrule. But, bold and free as was the old cavalier in expressing disapprobation of the foolish and injurious policy of the royal authority, still, in his eyes there were no crimes so black as disloyalty and rebellion; and the implacable vengeance with which, a few years afterwards, he pursued, and the cruelty with which he punished, the participators in Bacon's most noble (and for a short time, successful) resistance to the galling despotism of the royal government, were doubtless deemed by Berkeley to be strictly required by his duty, not only as a governor, but as a man and a christian. Under the influence of noble feelings and impulses thus unfortunately perverted, after the suppression of the rebellion, he caused the blood of the actors to be "poured out like water;" and considering the small amount of population of the colony, (which then had existed but 70 years,) perhaps in no country, under like circumstances, was the vengeance of the law more unsparingly and bloodily inflicted. Yet Governor Berkeley, who urged on and carried through these acts of cruelty and legal murder, doubtless considered his course as neccessary and as praise-worthy, as if he had been engaged in exterminating ferocious or predatory wild beasts. With all this, Berkeley was just the man who, under different training, would have made one of the purest and sternest of republicans. The same materials (and they are of the most superior kind,) which were fashioned by education into a Berkeley, or a Claverhouse, would, under different circumstances, have made a Cato, a Pym, or a Carnot.—Ed. F. R.

Enquiries to Governor Berkeley, and answers.

1. What councils, assemblies, and courts of judicature are within your government, and of what nature and kind?

Answer. There is a governor and sixteen counsellors, who have from his sacred majestie, a commission of *Oyer and Terminer*, who judge and determine all causes that are above fifteen pound sterling; for what is under, there are particular courts in every county, which are twenty in number. Every year, at least, the assembly is called, before whom lye appeals, and this assembly is composed of two burgesses out of every county. These lay the necessary taxes, as the necessity of the war with the Indians, or their exigencies, require.

2. What courts of judicature are within your government relating to the admiralty?

Answer. In twenty-eight yeares there has never been one prize brought into the country; so that there is no need for a particular court for that concern.

3. Where the legislative and executive powers of your government are seated?

Answer. In the governor, council and assembly, and officers substituted by them.

4. What statute laws and ordinances are now made and in force?

Answer. The secretary of this country every year sends to the lord chancellor,* or one of the principal secretaries, what laws are yearly made; which for the most part concern only our own private exigencies; for, contrary to the laws of England, we never did, nor dare make any, only this, that no sale of land is good and legal, unless within three months after the conveyance it be recorded in the general court, or county courts.

5. What number of horse and foot are within your government, and whether they be trained bands or standing forces?

Answer. All our freemen are bound to be trained every month in their particular counties, which we suppose, and do not much mistake in the calculation, are near eight thousand horse: there are more, but it is too chargeable for poor people, as we are, to exercise them.

6. What castles and fforts are within your government, and how situated, as also what stores and provisions they are furnished withall?

Answer. There are five fforts in the country, two in James river, and one in the three other rivers of York, Rappahannock and Potomeck; but God knows we have neither skill or ability to make or maintain them; for there is not, nor, as far as my enquiry can reach, ever was one ingenier in the country, so that we are at continual charge to repair unskilfull and inartificial buildings of that nature. There is not above thirty great and serviceable guns; this we yearly supply with powder and shot as far as our utmost abilities will permit us.

7. What number of priviteers do frequent your coasts and neighbouring seas; what their burthens are; the number of their men and guns, and the names of their commanders?

Answser. None to our knowledge, since the late Dutch war.

8. What is the strength of your bordering neighbours, be they Indians or others, by sea and land; what correspondence do you keep with your neighbours?

Answer. We have no Europeans seated nearer to us than St. Christophers or Mexico that we know of, except some few ffrench that are beyond New England. The Indians, our neighbours are absolutely subjected, so that there is no fear of them. As for correspondence, we have none with any European strangers; nor is there a possibility to have it with our own nation further than our traffick concerns.

9. What arms, ammunitions and stores did you find upon the place, or have been sent you since, upon his majestyes account; when received; how employed; what quantity of them is there remaining, and where?

Answer. When I came into the country, I found one only ruinated ffort, with eight great guns, most unserviceable, and all dismounted but four, situated in a most unhealthy place, and where, if an enemy knew the soundings, he could keep out of the danger of the best guns in Europe. His majesty, in the time of the Dutch warr, sent us thirty great guns, most of which were lost in the ship that brought them. Before, or since this, we never had one great or small gun sent us, since my coming hither; nor, I believe, in twenty years before. All that have been sent by his sacred majesty, are still in the country, with a few more we lately bought.

10. What monies have been paid or appointed to be paid by his majesty, or levied within your government, for and towards the buying of armes, or making or maintaining of any ffortifications or castles, and how have the said monies been expended?

Answer. Besides those guns I mentioned, we never had any monies of his majesty towards the buying of ammunition or building of fforts. What monies can be spared out of the publick revenue, we yearly lay out in ammunition.

11. What are the boundaries and contents of the land, within your government?

Answer. As for the boundaries of our land, it was once great, ten degrees in latitude, but now it has pleased his majesty to confine us to halfe a degree.* Knowingly, I speak this: Pray God it may be for his majesty's service, but I much fear the contrary.

12. What commodities are there of the production, growth and manufacture of your plantation; and particularly, what materials are there already growing, or may be produced for shipping in the same?

Answer. Commodities of the growth of our country, we never had any but tobacco, which in this yet is considerable, that it yields his majesty a great revenue; but of late, we have begun to make silk, and so many mulberry trees are planted, and planting, that if we had skilfull men from Naples or Sicily to teach us the art of making it perfectly, in less than half an age, we should make as much silk in an year as England did yearly expend three score years since; but now we hear it is grown to a greater excess, and more common and vulgar usage. Now, for shipping, we have admirable masts and very good oaks; but for iron ore, I dare not say there is sufficient to keep one iron mill going for seven years.

13. Whether salt-petre is or may be produced within your plantation, and if so, at what rate may it be delivered in England?

Answer. Salt-petre, we know of none in the country.

14. What rivers, harbours or roads are there in or about your plantation and government, and of what depth and soundings are they?

Answer. Rivers, we have four, as I named before, all able, safely and severally to bear an harbour a thousand ships of the greatest burthen.

15. What number of planters, servants and slaves; and how many parishes are there in your plantation?

Answer. We suppose, and I am very sure we do not much miscount, that there is in Virginia above forty thousand persons, men, women and children, and of which there are two thousand *black slaves*, six thousand *christian servants*, for a short time, the rest are born in the country or have come in to settle and seat, in bettering their condition in a growing country.

16. What number of English, Scots, or Irish have for these seven yeares last past come yearly to plant and inhabite within your government; as

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* By an order of the Lords Commissioners for foreign plantations, made in 1679, it is made the duty of the clerk of the assembly to send them a copy of the journal and laws of each assembly.

* This must allude to the eastern boundary, on the sea shore.

also what *blacks* or *slaves* have been brought in within the said time?

Answer. Yearly, we suppose there comes in, of servants, about fifteen hundred, of which, most are English, few Scotch, and fewer Irish, and not above two or three ships of negroes in seven years.

17. What number of people have yearly died, within your plantation and government for these seven years last past, both whites and blacks?

Answer. All new plantations are, for an age or two, unhealthy, till they are thoroughly cleared of wood; but unless we had a particular register office, for the denoting of all that died, I cannot give a particular answer to this query, only this I can say, that there is not often unseasoned hands (as we term them) that die now, whereas heretofore not one of five escaped the first year.

18. What number of ships do trade yearly to and from your plantation, and of what burthen are they?

Answer. English ships, near eighty come out of England and Ireland every year for tobacco; few New England ketches; but of our own, we never yet had more than two at one time, and those not more than twenty tuns burthen.

19. What obstructions do you find to the improvement of the trade and navigation of the plantations within your government?

Answer. Mighty and destructive, by that severe act of parliament which excludes us the having any commerce with any nation in Europe but our own, so that we cannot add to our plantation any commodity that grows out of it, as olive trees, cotton or vines. Besides this, we cannot procure any skilfull men for one now hopefull commodity, silk; for it is not lawfull for us to carry a pipe stave, or a barrel of corn to any place in Europe out of the king's dominions. If this were for his majesty's service or the good of his subjects, we should not repine, whatever our sufferings are for it; but on my soul, it is the contrary for both. And this is the cause why no small or great vessells are built here; for we are most obedient to all laws, whilst the New England men break through, and men trade to any place that their interest lead them.

20. What advantages or improvements do you observe that may be gained to your trade and navigation?

Answer. None, unless we had liberty to transport our pipe staves, timber and corn, to other places besides the king's dominions.

21. What rates and duties are charged and payable upon any goods exported out of your plantation, whether of your own growth or manufacture, or otherwise, as also upon goods imported?

Answer. No goods, either exported or imported, pay any the least duties here, only two shillings the hogshead on tobacco exported, which is to defray all public charges; and this year we could not get an account of more than fifteen thousand hogsheads, out of which the king allows me a thousand* yearly, with which I must maintain the port of my place, and one hundred intervening charges that cannot be put to public account. And I can knowingly affirm, that there is no government of ten years settlement, but has thrice as much allowed him. But I am supported by my hopes, that his gracious magesty will one day consider me.

22. What revenues doe or may arise to his majesty within your government, and of what nature is it; by whom is the same collected, and how answered and accounted to his majesty?

Answer. There is no revenue arising to his majesty but out of the quit-rents; and this he hath given away to a deserving servant, Col. Henry Norwood.

23. What course is taken about the instructing the people, within your government in the christian religion; and what provision is there made for the paying of your ministry?

Answer. The same course that is taken in England out of towns; every man according to his ability instructing his children. We have fforty-eight parishes, and our ministers are well paid, and by my consent should be better, *if they would pray oftener and preach less.* But of all other commodities, so of this, *the worst are sent us*, and we had few that we could boast of, since the persecution in *Cromwell's* tiranny drove divers worthy men hither. But, I thank God, *there are no free schools* nor *printing*, and I hope we shall not have, these hundred years; for *learning* has brought disobedience, and heresy, and sects into the world, and *printing* has divulged them, and libels against the best government. God keep us from both!

[The same hostility to the introduction of *printing* which was manifested by Sir. William Berkeley, was shown by Lord Culpeper, who was governor of Virginia in 1683, only *eleven years* after these principles were avowed by Sir William Berkeley. It will be seen by the following extract, which is from a MS. of unquestionable authority, that at last mentioned date, a printer had actually commenced his business in Virginia, but was prohibited by the governor and council from *printing any thing*, till the king's pleasure should be known; which, it may be presumed was very tardily communicated, as the first evidence of printing thereafter in Virginia was on the revised laws contained in the edition of 1733.

"February 21st, 1682, John Buckner called "before the Lord Culpepper and his council for "printing the laws of 1680, without his excellen-"cy's licence, and he and the printer ordered to "enter into bond in £100 *not to print any thing* "thereafter, until his majesty's pleasure should be "known."] *(Bland MS. pa. 498.)*

From the Magazine of Horticulture.

ON THE CULTIVATION OF BRUSSELS SPROUTS.

The Brussels sprouts are highly prized throughout Europe, as a culinary vegetable. Therefore it is grown as extensively as any of the brassica or cabbage tribe. The appearance of the plants is more like the Savoy cabbage than any other variety, with this difference—the stems grow to the height of three or four feet, and are closely set, from the bottom to the top, with sprouts like small cabbages in miniature; each being from an inch to two inches in diameter.

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* He means £1000 sterling money; which was the stated salary of the governor; besides which the assembly allowed Sir William Berkeley, who is here speaking, an additional salary of £200.—*Hening*

The plants are raised from seed sown in April or May, an ounce of which, if good, will be sufficient to sow a bed four feet wide by ten in length. If the seed is sown in April, (which would be the best method,) on a slight *hot-bed*, under glass, the plants will be ready for the final transplanting by the second or third week in May. Select a piece of ground for this purpose, that is in good heart, and where the soil is deep. The plants need not be set out more than eighteen inches apart *each way*, as the head does not spread like a Savoy, and the leaves drop off before the sprouts are ready for gathering, which will be by the first of October. The tops or heads ought to be cut off *two or three weeks* before the sprouts are gathered for use.

The whole treatment, as to the cultivation and management, is precisely the same as the Savoy cabbage. In November, or before the ground freezes hard, the plants might be taken up, and planted in earth in a cellar, pretty close together, and would be found to be an excellent vegetable through the winter. J. W. RUSSELL.

Mount Auburn, Cambridge, March 8, 1839.

COMPARATIVE COST OF HAY, ROOTS, &c. FOR FEEDING STOCK.

Extract from the Address of Rev. H. Colman, Commissioner of the Agricultural Survey of Massachusetts.

"I wish briefly to draw the attention of Farmers to the value of hay, compared with other crops, for the feeding of stock. An acre of hay yields one ton and a half of vegetable food. An acre of carrots, or Swedish turnips, will yield from ten to twenty tons; say fifteen tons, which is by no means an exaggerated estimate. It has been ascertained by experiment, that three working horses, fifteen and a half hands high, consumed at the rate of two hundred and twenty-four pounds of hay per week, or five tons one thousand and forty-eight pounds of hay per year, besides twelve gallons of oats each per week, or seventy-eight bushels by the year. An unworked horse consumed at the rate of four and one-quarter tons of hay in the year. The produce, therefore, of nearly six acres of land is necessary to support a working horse by the year; but half an acre of carrots, at six hundred bushels to the acre with the addition of chopped straw, while the season for their use lasts, will do as well if not better. These things do not admit of doubt. They have been subjects of exact trial.

"It is believed that the value of a bushel of Indian-corn in straw and meal, will keep a healthy horse in good condition for work a week. An acre of Indian-corn which yields sixty bushels will be ample for the support of a horse through the year. Let the farmer, then, consider whether it be better to maintain his horse upon the produce of half an acre of carrots, which can be cultivated at an expense not greatly exceeding the expense of half an acre of potatoes, or upon half an acre of ruta baga, which can be raised at a less expense than potatoes, or upon the grain produce of an acre of Indian-corn, or, on the other hand, upon the produce of six acres of his best land in hay and grain; for six acres will hardly do more than to yield nearly six tons of hay and seventy-eight bushels of oats. The same economy might be successfully introduced into the feeding of our cattle and sheep.

"These facts deserve the particular attention of the farmers who are desirous of improving their pecuniary condition. It is obvious how much would be gained by the cultivation which is here suggested; how much more stock would be raised, how much the dairy produce might be increased; and how much the means of enriching the land, and improving the cultivation, would be constantly extending and accumulating. But when we find on a farm of two hundred acres, that the farmer cultivates only two acres of potatoes, one acre of ruta baga, and perhaps a quarter of an acre of carrots, we call this "getting along," in the common phrase, but we can hardly dignify it with the name of farming. I am aware that labor of a proper kind is in many cases difficult to be procured, and with our habits, as difficult to be managed. Farming, likewise, can in few situations be successfully managed, unless the farmer has capital to employ, equal at least, to one year's manure, and one year's crops. A large portion of our farmers, also from the nature of their habits and style of living, are so prosperous and independent, that they have no occasion to extend their cultivation beyond what it now is, in order to meet their wants; and to incur all the trouble, vexation, and risk of employing more labor, expending more capital, and increasing their cares."

TABLES OF SILK-WORM REARING.

The following tables will be found very useful, as well as interesting, to those who are just about to commence their noviciate in the new business of feeding silk-worms.

The two first tables, together with the observations and estimates annexed, are taken from the great work of Count Dandolo, the highest authority on this subject; and they exhibit the actual operations of the author for two successive years, one of which (1814) was especially unfavorable in the predominance of cold and wet weather. It will be seen that there were 26 rainy days out of 37, besides cloudy ones when no rain fell; and the temperature was low in proportion.

The third table is by Bonafous, another scientific and celebrated silk-culturist of Piedmont, and is founded principally on the work of Dandolo; though it directs wider spaces.

The temperature is marked by Fahrenheit's thermometer. The weights and measures of dimensions are French. The linear French foot (of 12 inches) exceeds ours, by three-fourths of a French inch; or 93.89 French feet, make 100 American. The French pound also exceeds the American as 1400 to 1281; that is, the quantity of 1281 lbs. of leaves required for the last age of feeding, as stated in the third table, is equal to 1400 lbs. American.

The prices stated are in Milanese money—the *livre (lira)* of 20 *sous (soldi)* being equal to 8*d*. sterling, or about 15 cents, American.—ED. F. R.

FIRST TABLE.—REARING of SILK-WORMS proceeding from Five Ounces of Eggs.

1813. Days of rearing.	Months.	Sorted Leaves given to the Silk-Worms.			Internal temperature.	External temperature.	ORSERVATIONS.
1st Age			*lbs.*	*oz.*	*degs.*	*degs.*	
Day 1	May 18	Leaves	4	4	75	66	FIRST AGE.—The day of rearing begins after twelve o'clock afternoon. Dry cold air. The exterior temperature was at 62nd to 64th degree, to the west at 5 o'clock in the morning.
2	19		6	0	75	64	
3	20		12	0	75	66	
4	21		6	4	75	66	
5	22		1	8	75	62½	
			30	0			
2nd Age							
Day 6	23	Small branches and leaves	18	0	73½	64	SECOND AGE.—Fine weather. Dry air.
7	24		30	0	73½	64	
8	25		33	0	73	64½	
9	26		9	0	73	66	
			90	0			
3rd Age							
Day 10	27	Small branches and leaves	30	0	71½		THIRD AGE.—Little variation in the external temperature, south winds predominated, heavy air, rain. The dry air experienced in the second age had imparted great vigor to the insects.
11	28		90	0	71½		
12	29		97	8	71		
13	30		52	8	71		
14	31		30	0	71		
			300	0			
4th Age							
Day 15	June 1	Small branches and leaves	0	0	71		FOURTH AGE.—Some silk-woms placed in a temperature of 64 degrees became torpid during fifty hours.
16	2		97	8	71		
17	2		165	0	69		
18	4		225	0	69		
19	5		255	0	69		
20	6		127	8	69		
21	7		30	0	69		
22	8		0	0	69		
			900	0			
5th Age							
Day 23	9	Small branches and leaves	180	0	69		FIFTH AGE.—The season was extremely unfavorable from the 13th until the 18th of June. The thermometer placed in the west, stood during the 15th, 16th, and 17th as low as 53 degrees, at *five* o'clock in the morning. Cold rain almost uninterrupted, although the barometer did not indicate great moisture of atmosphere.
24	10		270	0	69		
25	11		420	0	69		
26	12		540	0	68		
27	13		810	0	68		
28	14		975	0	68		
29	15		900	0	68		
30	16		660	0	69		
31	17		495	0	69		
32	18		240	0	69		
5th Age - - - - - - -			5490	0			
4th Age - - - - - - -			900	0			
3rd Age - - - - - - -			300	0			
2nd Age - - - - - - -			90	0			
1st Age - - - - - - -			30	0			
Sorted leaves - - - - -			6810	0			

Weight of mulberry leaves, per ounce of eggs, 1609 pounds 8 ounces. The silk-worms proceeding from five ounces of eggs, which have consequently consumed 8047 pounds 8 ounces of leaf, produced 607 pounds 8 ounces of choice cocoons, and six pounds of coarse floss. About 20 pounds 1 ounce of leaves were consumed to a pound of cocoons.

1813. *Expenses incurred, and profit.*

	Milan livres.	Sous.
Dr.		
Five ounces of silk-worms' eggs,	15	0
Fuel-wood for hatching them,	1	15
83 quintals, or 80 cwts. of mulberry leaves, at 4 livres 13 sous, average price the quintal,	385	0
18 quintals 75 lbs. of shavings, thick wood and brushwood, at 1*l.* 1s. 4*d.* the quintal,	20	0
Boughs or broom to form the hedges for the worms to rise upon	18	0
Paper to put upon the wicker trays,	14	0
Oil for the lamps,	9	0
Fumigating bottle,	1	10
Expense of gathering the mulberry leaves, at the rate of 22 sous 8 dec. per quintal,	96	5
100 days men's labor, at 25 sous per day, women at 15 sous; when the men work extra hours at night they get 10 sous more, and the women 5 sous additional, altigether amounting to	103	10
Ground-rent, and interest of capital employed for purchase of trays, wicker, and other trifling articles,	90	0
Total,	754 Liv. M.	

Most of the paper and fagots of brooms may esrve for the following year.

Cr.

613 lbs. 8 oz. of cocoons were drawn from the laboratory, which, sold at 34 sous 6 dec., make about 1068 0

Net profit in favor of the person who has reared the worms on his own account, Liv. 809 8 s.

Second Table.—REARING OF SILK-WORMS *proceeding from five ounces of eggs.*

1814. Days of rearing.	Months.	Sorted Leaves.			Internal temperature.	External temp. at five o'clock in the morning, westerly.	Hygrometer of M. Bellani.	Weather.
						5 o'clock in the morning.		
1st Age			*lbs.*	*oz.*	*degrees.*	*degrees.*		
Day 1	May 23		2	2	78 71	53	. . .	rain
2	24		3	9	71	48	. . .	rain and storm
3	25		4	9'	71 69	41	. . .	rain and sun
4	26		8	0	69	46	. . .	clouds and sun
5	27		7	9	71	50	. . .	cloude
6	28		4	3	71½	55	. . .	rain
			30	0				
2nd Age							*degrees.*	
Day 7	29	Small branches and leaves.	8	10	71	48	68	rain
8	30		16	8	71	53	70	fog and sun
9	31		23	6	68	57	64	ditto
10	June 1		22	8	68	57	66	rain
11	2		10	8	68	64	66	rain and sun
12	3		1	8	69	62	70	clouds
			83	0				
3rd Age								
Day 13	4	Small branches and leaves.	21	0	69	55	68	rain and sun
14	5		45	0	68	55	69	clouds and sun
15	6		60	0	69	62	70	rain and sun
16	7		90	0	69	57	75	rain
17	8		75	0	69	56	74	ditto
18	9		30	0	69	53	79	rain and sun
19	10		3	0	69	57	78	ditto
			324	0				
4th Age								
Day 20	11	Small branches and leaves.	75	0	69	57	76	rain and sun
21	12		127	8	69	64	75	clouds and sun
22	13		180	0	68	65	71	fine
23	14		195	0	66	62	74	clouds and sun
24	15		249	0	66	65	75	sun and rain
25	16		105	0	68	66	72	ditto
26	17		7	8	69	57	70	fine
			939	0				
5th Age								
Day 27	18	Small branches and leaves.	180	0	68	60	72	fine
28	19		270	0	68	62	73	rain and sun
29	20		360	0	68	57	73	ditto
30	21		465	0	66	59	75	rain
31	22		540	0	68	57	73	clouds and rain
32	23		675	0	68	53	72	rain and sun
33	24		825	0	68	55	74	ditto
34	25		975	0	68	53	74	ditto
35	26		750	0	69	55	73	ditto
36	27		420	0	69	55	73	clouds and rain
37	28		270	0	69	50	72	rain and sun
5th Age			5730	0				
4th Age			939	0				
3rd Age			324	0				
2d Age			83	0				
1st Age			30	0				
Sorted leaves			7106	0				

Observations on Second Table.

First Age.—The silk-worms, on some tables or hurdles, roused sooner than others; by reason of the exterior cold, the temperature of the small laboratory was, in some parts, a degree and a half below other parts, although the whole laboratory was well closed, and lined to keep out the cold. This degree of cold was on the side of the apertures, and lower rows of tray hurdles.

Second Age.—The silk worms became torpid and roused with more regularity, and at less distant periods than in the first age.

Third Age.—All proceeded with regularity in this third age.

There were twenty-four pounds more of mulberry leaves consumed this year than in 1813.

There was less refuse picked from the leaves in 1814 than in 1813, consequently the average quantity of leaf must have been nearly the same both years.

Fourth Age.—Two days were employed in cleaning the wickers, because the silk-worms that were placed in the coolest part of the laboratory, became torpid, and roused a whole day later than the others.

Thirty pounds more of sorted leaves were consumed than in the year 1813, but in 1814 there was less refuse. The progress of the fourth age was tolerably regular.

Fifth Age.—The cold, and variableness of the weather, render these last eleven days of the season remarkable.

The silk-worms continue to prosper. But as the nights were very cold, an even temperature, equal throughout every part of the laboratory, could never be obtained. Fires were lighted in the stoves, and thick wood was burnt in the grates, to maintain the necessary temperature.

There were eighty-four pounds more of leaves consumed than in the year 1813.

The refuse of the leaves and the weight of dung were less than in 1813.

There were fewer mulberries on the branches, and even those were lighter in 1814, than in the preceding seasons. There were obtained six pounds more of cocoons. Some wicker hurdles required a little leaf on the 29th of June, the thirty eighth day of the rearing of the silk-worms, and they received that which had not been consumed the preceding day.

1626 pounds of leaves per ounce of eggs The silk-worms of five ounces of eggs having consumed 8130 pounds of leaves, produced 601 pounds 8 ounces of choice cocoons, and 4 pounds 8 ounces of offal. About 20 pounds of leaves were consumed for a pound of cocoons.

1814. *Expenses incurred, and profit.*

	Milan liv.	Sous.
Dr.		
Five ounces of silk-worm's eggs,	15	0
Fuel-wood for hatching them,	1	15
8250 lbs. of leaves, at 4 livres 13 sous and 6 decimes, the 100 lbs. or quintal,	385	0
Expense of gathering the leaves,	96	5
Shavings, large and small firewood, 15 quintals, at 1 livre 4 sous the quintal,	16	0
Fagots and broom to form the hedge for the worms to rise on, in addition to those of the preceding year, 1813,	4	10
Paper, in addition to that of preceding year,	4	0
Oil for lamps,	9	0
Fumigating bottle,	1	10
For day-labor, men and women,	109	0
Total,	642	0
Ground rent and interest of capital employed,	90	0
	732 M. liv.	
Cr.		
601 lbs. 1 oz. of cocoons were drawn from the laboratory, which sold at 52 sous per lb., and produced	1563	18
Net profit,	831	18 s.

THIRD TABLE.—REARING OF SILK-WORMS, *to the Sixth Age, from one ounce of Eggs.*

Ages.		Space occupied by the worms on the feeding frames, or hurdles.		Temperature; Fahrenheit's scale.	Quantity of leaves.		Total of leaves for each age.	*Observations.*
		Ft.	*In.*	*degs.*	*lb.*	*oz.*	*lbs.*	
FIRST AGE	1st day	9	6	75	0	14	7	Tender young leaves chopped fine; four meals progressively increased.
	2d do.				1	6		“ “ “ the first the largest, the last the smallest.
	3d do.				3	0		“ “ “ four meals.
	4th do.				1	6		The first meal of 9 oz. the others less if the leaves have not been eaten.
	5th do.				0	6		Tender leaves chopped fine. Worms casting their first skins.
SECOND AGE	1st day	19		73 to 75	4	8	21	Half tender branches and half leaves, cut fine; the first meal 12 ounces, the other leaves in four meals.
	2d do.				6	12		Tender leaves, four meals; the two first less than the two last. Enlarge the spaces.
	3d do.				7	8		“ “ the two first the largest.
	4th do.				2	4		“ “ distribute as wanted. Worms casting their second skins.
THIRD AGE	1st day	46		71 to 73	6	12	69	Half tender branches, half leaves a little chopped; second meal 1 lb. 14 oz.
	2d do.				21	8		Chopped leaves, four meals; the two first less than the two last. Enlarge the spaces.
	3d do.				22	8		“ “ the two first the largest.
	4th do.				12	8		“ “ “ “
	5th do.				6	8		“ “ distributed as required. Third casting of their skins.
	6th do.				—	—		“ “ “ “ Worms are roused.
FOURTH AGE	1st day	109		68 to 71	23	4	210	9 lbs. of branches, 14 lbs. of leaves, cut coarsely; give the branches first.
	2d do.				39	0		Leaves coarsely cut, four meals; the two first the smallest. Enlarge the spaces.
	3d do.				52	8		“ “ three meals; the three first the least, the last 17 lbs. 4 oz.
	4th do.				59	4		Whole leaves, four meals; the three first 16 lbs. 4 oz., the last 10½ lbs.
	5th do.				29	4		Picked leaves distributed as wanted; the first meal the largest.
	6th do.				6	12		“ “ “ Worms prepare to cast their skins.
	7th do.				—	—		Leaves as wanted. Worms are roused.
FIFTH AGE	1st day	239		68 to 69	42	0	1281	Half branches and half leaves. Enlarge the spaces.
	2d do.				65	10		Picked leaves, four meals; the first the smallest, 12 lbs.; the last 22 lbs.
	3d do.				93	0		“ the first meal 22 lbs., the last 27 lbs. 12 oz.
	4th do.				130	0		“ “ 27 lbs. 12 oz., the last 37½ lbs.
	5th do.				185	8		“ “ 37½ lbs., the second 46 lbs. 14 oz.
	6th do.				223	0		“ four meals, the last the most abundant.
	7th do.				214	0		“ “ the first meal the largest, the rest to lessen gradually.
	8th do.				150	0		“ four or five meals, the first the largest, 46 lbs. 14 oz.
	9th do.				120	14		“ distributed as wanted. Worms approach maturity.
	10h do.				56	4		“ “ “ If not enough, give more.

PLAN OF A COCOONERY, AND FIXTURES FOR THE SPINNING OF THE SILK-WORMS.

The 'Directions for the management of Silk-worms,' translated for and published in the last volume of the Farmers' Register, (commenced at page 464,) stopped at the period when the worms were ready to spin their cocoons. This was because it was not thought desirable to present the very troublesome and yet defective European methods of arranging the "hedges" or arcades of heath, bushes, &c. for the worms to climb and spin upon. We are now enabled, by the aid of a correspondent who has seen and observed much on this subject, to redeem the promise then made, of presenting a more simple and yet more perfect plan of fixtures, for this part of the business, heretofore the most difficult for novices to understand from description, and still more difficult to execute.

As a connecting link of the former 'Directions,' with the following communication, it is proper to say here, that after the general indications of the silk-worms being ready to climb and spin, such of them as still require more food, should have it given with care and moderation. After nearly all have mounted, there will always be some slower ones remaining, from their not having received enough food, or some other cause of injury. These should be removed to a place of greater heat, and well aired, which will hasten the maturity of all except such as may be too much injured to form cocoons.—Ed. F. R.

For the Farmers' Register.

Much as has been written on silk-culture at large, I have not observed in any of the publications of the day, such a description of the fixtures of a cocoonery, according to the most approved and convenient plan, as would enable an inexperienced culturist to have one constructed. It is, indeed, a difficult subject to treat in an intelligible manner; but, with the aid of diagrams, the difficulty may possibly be overcome.

The advantages of the modern over the old fixtures, must be apparent on the slightest examination, to every person who has any experience in the rearing of silk-worms. The slow and tedious process of shifting the worms, and cleaning the shelves of litter, is now entirely superseded; and all the careful provision of brush and dried leaves, or of broom-corn and straw, is totally dispensed with. The management of the silk-worm is at present conducted with a saving of labor and a facility which were not attained in former times. It is true that the expense of putting up these fixtures is considerably greater; but the additional cost is fully compensated by the substitution of durable, in the place of perishable materials—by neatness for clumsiness—by the attainment of increased facilities in conducting the operations—in short, by a more perfect adaptation to the end to be obtained.

Having enjoyed the opportunity of inspecting a number of cocooneries during the past feeding time, and being desirous of contributing my mite to the great work which is now exciting so much interest, I submit a description of the building which appeared to me to unite the greatest number of advantages.

The building is 100 feet long by 30 feet wide, in the clear, and two stories high, besides the basement or cellar. The dimensions of a house, however, unless it is erected expressly for a cocoonery, are of secondary importance. If 30 feet wide, which is a very convenient size, there should be four ranges of shelves running lengthwise of the room. Each of these ranges, or rows of shelves, occupies a space of three feet of the width of the room, which will leave 18 feet to be divided into five aisles, or passages, each three and a half feet wide, viz.: two of the passages outside of the shelves and between them and the walls, and three between the several rows of shelves. There should also be three passages across the room, namely, one at each end, and one in the middle, opposite the doors. The annexed drawing, though not well proportioned, may convey an idea of the ground-work, or manner in which the rows of shelves and passages are laid off.

Fig. 1. *Part of the horizontal plan of the shelves, and passages.*

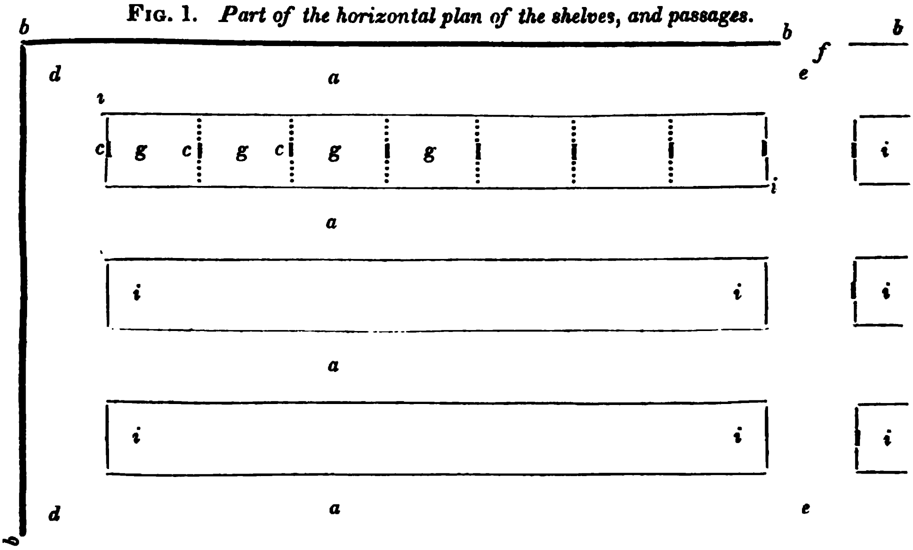


FIG. 1. *b, b, b,* Part of outer wall of cocoonery.
a, a, a, Parts of passages running lengthwise.
d d, e e, Cross passages.
f, Door.
g, g, g, &c. Hurdles.
i i, i i, &c. Ranges of shelves.
c, c, c, &c. Upright posts.

A single row of posts serves for one row of shelves. The posts *c, c, c,* are of plank 8 inches wide by 1½ inches thick; they reach from the floor to the ceiling, and are exactly 4 feet apart from the centre of one to the centre of the other. They are to be accurately ranged with each other, (in the direction of the length of the shelves,) throughout the length of the row. It is to these posts that the superstructure is attached, both for feeding the worms and accommodating them when they are ready to spin. To explain the manner in which the fixtures are put up, and to render the whole description as intelligible as possible, the reader is referred to the following drawing, fig. 2, which represents the position of the posts, and so much of one of the shelves as is included between two of the posts.

FIG. 2. *Horizontal plan, (on enlarged scale,) of the frame-work of a portion of the shelves.*

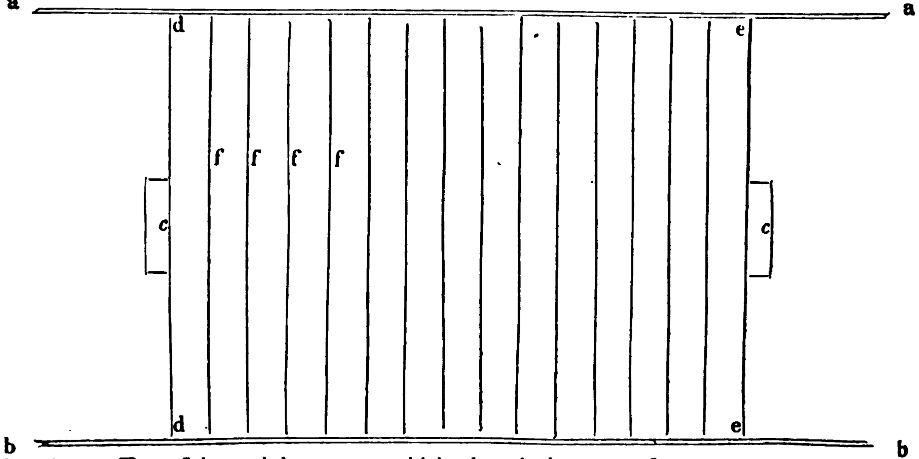


FIG. 2. *c, c,* Two of the upright posts, to which are nailed, *d d,* and *e e,* cross-laths.

a a, b b, Parts of the longitudinal laths, three-fourths of an inch across, and 2 inches deep, nailed to cross-laths *d d,* and *e e.*

f, f, f, f, &c. Other cross-laths of same sizes, nailed to *a a,* and *b b.*

The boards which form the shelves is to be nailed on this frame-work, and a hurdle to lie on the space between the posts *c, c.*

The first or lowest shelf of each of the four rows or ranges, is 14 inches from the floor of the room; and the same space is preserved between the top of the lowest shelf, and the bottom of the one immediately above it, and so on from one to another, until the proper height for the uppermost shelf is attained. It is by this arrangement that a room of moderate size may be fixed to contain a considerable number of worms. The number of tiers of shelves, in the same row, may be from four to eight, according to the height of the ceiling and other circumstances. At 14 inches then from the floor, laths or strips 2 feet 10½ inches long, and 2 inches wide by ¾ thick, (lines *d, d,*) are nailed upon the flat sides of the posts (*c, c,*) and at right angles to them. Other laths of the same length and size, are then to be nailed on the opposite sides of the posts, and the same height above the floor. The ends of these laths are connected together by pieces of similar dimensions, (*a a, b b,*) but of greater length, say 8, 12 or 16 feet long, (the posts being 4 feet apart,) running longitudinally with the room. They are nailed to the ends of the short laths. The spaces between the posts (*c, c,*) are to be supplied with other cross strips (*f, f, f, &c.*) of the same size and length of *d d,* three inches apart from centre to centre, and fastened at the ends to the pieces *a a, b b.* The framework here attempted to be described, and on which the floors or shelves are to be laid, may be illustrated by comparing it to the sills and sleepers of a house, before the floor is put down. The only difference in the two cases is, that in a house, the planks of the floor are laid *across* the sleepers. In the present case the planks of the shelf are placed in the same direction *with* the sleepers (*f, f, f, &c.*) As the shelves are three feet wide, the planks therefore must be sawed up in lengths of three feet. They should be of very thin boards; half inch, or five-eighths at most, in thickness. It is proper to have them tongued and grooved, in order to prevent the litter from falling through, and interfering with the worms on the shelf below. The floor is fastened down by first nailing the ends of the planks to the laths *a a, b b;* and afterwards by driving one or two nails through the floor into each of the cross laths or sleepers, *d, e, f.* The floor is to be fitted round the posts, so as to present an unbroken surface; and, in order to facilitate the workman in this part of the business, it would be best to procure boards of regular width, so that a specified number, 4, 6 or 8, would, when dressed and jointed, reach from the centre of one post to the centre of the next.

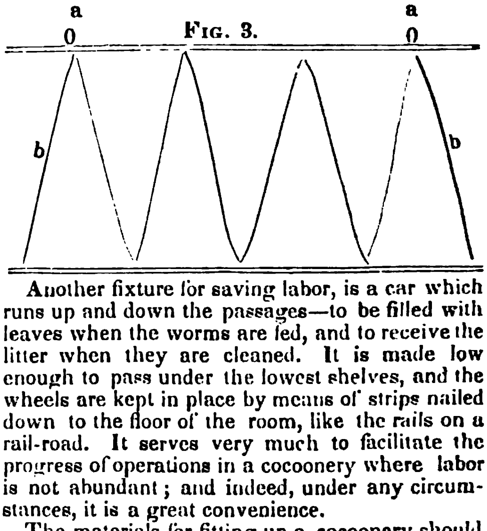
The worms are fed on hurdles placed on the shelves—one hurdle on every shelf, and between every two posts. Hurdles of network are now in general use at the north, though there still exists a prejudice against them in the minds of some silk-growers. In extensive cocooneries, however, it is difficult to conceive how they can be dispensed with. Their size should be made to correspond to the width of the shelf, and the distance between the posts; say 3 feet by 3 feet 10¼ inches, which will allow a quarter of an inch play between the posts. The vacant spaces between the hurdles and opposite to the posts, should be closed by strips of a suitable size when the worms are ready to spin; otherwise, some of them will form their cocoons in these vacancies. The frames of the hurdles are made of laths 2 inches by ⅝ths. The most expeditious, as well as the strongest, way of putting them together, is to lay the laths *flat* in a mitre box; and saw off the pieces into proper lengths. Then with a brace-bit, bore a hole (in horizontal direction,) at each corner of the frame, and fasten together with pins. It is best that the hole should be bored as near to the inner angle of the corner, as the length of the bit will allow; and it would add still more to the strength of the frame, to dip the pins in glue, and even to glue the joints. The network, which is made of well twisted, smooth cotton twine, is first tied to each corner of the frame, and then stretched by means of a string passed through the outer row of meshes, and drawn over tacks or small nails driven on the upper side and near the inner margin of the laths, at distances of three or four inches from each other. The meshes are about an inch square, tied together at the corners like a seine. This net is obtained at the north at a very moderate cost, not exceeding 8½ cents the square yard. There is an inferior article which is *woven*, that costs about 6 cents. Either of them, however, could readily be prepared in most families.

The changing of the worms renders it necessary that the number of hurdles should be greater than merely sufficient to occupy the shelves at any one time. Perhaps half as many more would constitute a full supply. In feeding, the hurdle lies on the shelf with that side underneath, and in contact with the shelf, to which the network is attached. When the operation of shifting the worms and carrying off the litter is to be effected, a fresh hurdle is placed in the same position, immediately over the one which contains the worms, and resting upon it. Cut leaves are then to be sprinkled over it; and in a short time, a few hours at most, worms will have crawled upon the upper hurdle, when the lower one is to be withdrawn and emptied of its contents. By this process, great numbers of worms are changed in the course of a day, without any necessity for handling or even touching them.

But the chief merit of a cocoonery, such as I have attempted to describe, consists in the accommodations which are afforded to the worms for spinning. Immediately over the worms, at the bottom of the shelf above, amongst the sills and sleepers (so to say,) on which the floors of the shelves are laid, they find a place adapted to all their wants. In the recesses formed by the junction of the laths with the planks of the shelves, I have seen thousands of cocoons beautifully and regularly arranged. According to this plan, it will be necessary to have an extra shelf fitted up in the same manner, above the highest one on which the worms are reared. The advantages of this fixture for spinning, are several. It offers to the worms a quiet and secluded situation, at a time when they should not be subjected to interruption; while such as are backward in mounting, may be attended to, and supplied with food as usual. The cocoons are gathered with much greater facility. Instead of the old mode of picking them, one by one, out of brush and dried leaves, and separating them from the litter, a handful may be collected at once, without a particle of litter upon them. The situation, moreover, appears to be gratifying to them. They do not leave it in such large numbers as they frequently do other accommodations, to wander over the ceiling, or amongst the rafters of the building, before they can find a resting place.

To enable the worms to ascend more readily, ladders of very simple construction are prepared. Take two very small laths, about half an inch square, and 3 feet long—lay them down on a work bench, at distances from each other equivalent to the spaces between the shelves, (say 13 or 14 inches,) and connect them together by a twine cord, fastened to tacks driven in the laths every three or four inches. The tacks on the upper lath are not perpendicularly over those in the lower, but over the middle of the intermediate space; by which, the twine is inclined, as in the zigzag lines (*b b, &c.*) of fig. 3. When the worms are ready to climb, the ladders are suspended over each end of every hurdle, near the posts, by loops *a a*, attached to one of the strips of the ladder.

Fig. 3.



Another fixture for saving labor, is a car which runs up and down the passages—to be filled with leaves when the worms are fed, and to receive the litter when they are cleaned. It is made low enough to pass under the lowest shelves, and the wheels are kept in place by means of strips nailed down to the floor of the room, like the rails on a rail-road. It serves very much to facilitate the progress of operations in a cocoonery where labor is not abundant; and indeed, under any circumstances, it is a great convenience.

The materials for fitting up a cocoonery should be of the lighest wood, either poplar or any species of pine; and though not absolutely necessary, it would contribute greatly to the neat appearance of the whole work, if all the pieces were dressed, however slightly, with a plane.

It may be thought that the plan of having double rows of shelves, as in Count Dandolo's cocoonery, and indeed in many in this country built after the model of his, would possess advantages over the one now described. The wide passages which would thereby be gained, would certainly be a great acquisition; but it is at least questionable whether the inconvenience of having to reach over shelves six feet wide, would be at all compensated by this advantage. But to say nothing of feeding, the fixtures for spinning, though they might be fitted up in one case as well as in the other, would scarcely be available when the time arrived for gathering the cocoons. The wide shelves however, are now generally disapproved.

They are heavy and clumsy in appearance, and inconvenient in practice.

The spaces that silk worms require, do not seem to be very accurately defined. Of American writers, (who all follow the European authorities,) some speak of square feet, others of feet square; and others again simply mention the quantity of feet, without stating whether it is linear or superficial measure. Each hurdle, however, of the dimensions previously described, may accommodate a thousand worms during their last age; and from this datum, an estimate may be formed of the number that a room of any prescribed size will contain. A room for instace, 100 feet long and 80 feet wide, with four rows of shelves, and five shelves to a row—allowing for a cross passage in the middle and one at each end—will contain 440 shelves, and accommodate 440,000 worms. For every additional tier of shelves, which however could not conveniently exceed three more, the number might be increased 88,000, or amount in the aggregate to nearly 700,000. But foreign writers allow a still greater number to a house of these demensions. The laboratory of Count Dandolo, in which he reared the worms from twenty ounces of eggs, equal to more than 700,000, was 77 feet long, 30 feet wide, and 12 feet high. The number of shelves it contained is not specified. Experience alone can determine this point to general satisfaction; and until it is settled, silk-growers should rather err on the safe side, by allowing abundant space to their worms.

Although the most approved plan for constructing a cocoonery, has been attempted to be detailed, including the most convenient size for the building, yet fixtures of a much more clumsy description will answer very well on a diminished scale; and almost any house, even a barn or tobacco house, will serve for a cocoonery, provided a sufficient circulation and ventilation can be effected. But when the business is entered into extensively and systematically, the silk-grower will doubtless find it to his interest to build houses expressly for the purpose, and have them fitted up with a view to the greatest economy of time and labor, as well as to durability. "Whatever is well done, is twice done," says the old adage. But costly cocooneries, and convenient fixtures, alone, will not command success. The race is not always to the swift, nor the battle to the strong. Those who devote the most unremitted attention, by night as well as by day, in season and out of season, will be most likely to succeed.

T. S. PLEASANTS.

DAIRY STOCK.

From the Second Report of the Agriculture of Massachusetts.

The farmers are unanimous in their preference of the common native stock of the country, in which the Devon blood predominates, to any foreign stock with which they are acquainted. They are in general as decided in their preference of small, over large-sized cows. They are not, however, raisers of stock; and buy their cows wherever they can find them, according to their best judgment. The remarkable produce, if so it be considered, is to be attributed to extraordinary good management and keeping; and on this account, deserves the more attention, as showing what may be done.

The dairy stock in England which seems to have the preference over all others, is the Ayrshire. The origin of this stock is not well ascertained; but though it has some of the qualities of the improved Durham, it is a race distinct from that. Great pains have been taken and great expenses incurred, in order to introduce this fine Ayrshire race of cows into our state, by the Massachusetts Agricultural Society, and by an intelligent and public-spirited friend to agricultural improvement in Watertown. I regret that I am not able to obtain such returns as would enable me to speak confidently of the merits or defects of this stock, so far as these cases go; but I am safe in saying, that some slight disappointment has been experienced. It is probable, from the celebrity which they had obtained abroad, too much was expected from them here. Extravagant statements have been made respecting their produce in Scotland. One of the advocates for this stock, and a man upon whose authority great reliance is placed, has undertaken to calculate precisely the number of quarts of milk given, and the number of pounds of cheese made, from what is stated to be in money the average produce of an Ayrshire cow. This is certainly rather a loose way of reaching the result. Entire reliance cannot be placed upon it. This, another distinguished Scotch farmer and dairyman admits; and says that "those statements are far too high and not well founded."

He refers to a farmer, on whose exactness he entirely relies, whom he pronounces a man of superior intelligence and accuracy, and who has devoted himself to dairy husbandry, and, farther, whose stock were particularly select, and "who had every inducement to keep them in the highest condition requisite for giving the largest product in milk." The farmer referred to, states, that at the best of the season the average milk from each cow is nine Scots pints (4½ gallons,) and in a year, 1300 Scots pints or 650 gallons. A Scots pint is two quarts. Now, allowing these cows to be in milk 320 days, the average yield of a cow would be 8⅛ of a quart per day. But if we understand this to be wine measure, which is the usual standard of measurement in England, and compare it with our customary admeasurement of milk in Massachusetts, which is always beer measure, we must deduct one fifth; and then the average product of an Ayrshire cow, compared with ours, is 6½ qts. per day for 320 days. Such a yield is often surpassed by cows of our native stock. I have before me the case of a cow of native stock among us, who. in 268 days, yielded 2923 beer qts. of milk; and of another, that produced 3975 beer qts. of milk in ten months. I can produce, within my own knowledge, a list of nearly fifty cows of native stock, almost as productive as these. I do not mean to undervalue the imported stock. Far from it. I deem the introduction of the Ayrshire stock and the improved Durham short-horn, a great benefaction to the country. Their tendency to fatten, their early maturity, their beautiful proportions, highly commend them to our good will and our interests. As yet, we have not had, by any means, a sufficiently fair trial of their dairy properties so as to determine fully, either for or against them; and it has been found here, in repeated instances, as it has proved abroad, that a cow, from a cross of an improved Durham with the Devon, has given a valuable animal for the dairy. But among the great advantages which is to result from the introduction of this improved and beautiful stock, is this: to give our farmers a knowledge of what can be done by skill, intelligence, care, selection, and perseverance in the art of breeding animals for any purpose; in obviating defects of form, constitution, and habit; and in perpetuating and transmitting excellent and desirable properties. In the Ayrshire stock, and in the improved short-horns, the most shrewd and persevering efforts have been exerted, and the highest practical skill and philosophy have been taxed to carry this race to as great a degree of perfection as any thing of the kind can be; and the success has been decisive and wonderful. Excepting in one instance, to which I shall hereafter refer at large, perhaps there cannot be found in the whole of New England, a single instance of any enlightened, determined, and systematic attempt to form a race of animals of particular and desirable properties. It is most important that this should be attempted in different parts of our country, with what are called our native stock, who have become, in various ways, so crossed and mixed up, that there is in truth no particular race among them. A large portion of them are as ungainly, unthrifty, and unproductive as can well be represented or imagined. Yet there are among them so many extraordinary animals—extraordinary for their produce in milk, butter and cheese—that a few years of careful and intelligent selection from the materials already to our hand, and a strict observance of those philosophical principles of breeding which are well ascertained and understood, would undoubtedly give us a breed of animals, a stock or race of animals, greatly superior to that which now exists among us. This has been attempted in one instance by a highly intelligent breeder among us; and he is now able to show three generations of animals of as extraordinary character for the creamy or butyraceous quality of their milk, as has ever been known; two quarts of what is called the strippings, the last part drawn off of the milk of one of these cows, having repeatedly produced one pound of butter; and the cream, as it came from the pans, as I have seen myself, becoming by churning converted into butter of the finest description in less than one minute by the watch; and this process repeated at pleasure.

Let us now compare the amonnt of cheese made by the English dairies, with some in this county of which I have here given an account.

An Ayrshire cow, it is said by the English authorities, will yield 257 lbs. butter per annum, or about 5 lbs. per week, all the year round, besides raising the calf; or of new milk cheese, about 514 lbs. There returns are certainly large; but they rest upon a calculation of the quantity of milk, which the cow is supposed to yield, rather than upon any account of an actual yield. None at least is given. This, therefore, is not so satisfactory as it would be, if it were a precisely ascertained result. One of the best authorities says, that in England, "a well-fed cow of a good breed will produce, upon an average, 180 lbs. of butter in the season. The common calculation is, indeed, 150 lbs.; but this is made upon mixed stock, which affords no certain data. In the Epping district, where there is an indiscriminate mixture of Devon, Suffolk, Leicester, Holderness, and Scotch, the calculation, in a well-managed dairy, amounts to 212 lbs.; that is, 6 lbs. per week during 26 weeks, and 4 lbs. per week, during 14 weeks. The average product of cheese in the best dairies, where the whole milk and cream are used, cannot be estimated at more than 4 cwt.—that is, 448 lbs. On deep grazing soils, that carry a heavy stock, a well-managed cow is reckoned to make from three hundred and sixty pounds to six hundred pounds. In Somersetshire, the average is 4½ cwt., or 540 lbs.; in Essex not so high, and in the midland counties something more than 3 cwt." It will be seen, in looking back upon the dairy returns in some parts of this county, that they are inferior to these, not frequently passing beyond 250 or 300 lbs. of new milk cheese. On the other hand, the returns of some of the dairies in Cheshire show an actual amount of annual produce of more than 500 lbs. to a cow, and in some cases 627 and 632 lbs. It may be said, that this is owing to the fine pasturage which is to be found in Cheshire and its vicinity; to the particular care which is taken of the cows; and the system of high feeding adopted. But it shows conclusively that the cows are capable of being brought to this productive yield; and the feed and management are matters which can be adopted any where.

REMARKABLE DAIRY PRODUCTS. A MASSACHUSETTS FARMER.

From the same.

This farmer has now a dairy of 24 cows; and they produce a cheese per day, weighing about 100 lbs. Supposing that it requires a gallon of milk to produce one pound of cheese, this would give 400 quarts of milk per day, or at the rate of 16⅔ of a quart to a cow. These cows are all of native stock; most of them raised by himself. His average product of new milk cheese to a cow in a season, is between 500 and 600 lbs. Last year the actual yield was 598 lbs. to a cow. Of his 24 cows last year, two were heifers of two years old, just come in. Four years since he was the owner of a cow, whose milk in the best season amounted by actual weight to 70 lbs. per day. During the time of her greatest yield, she was fed with four pails of cheese whey, and some rye meal. She was of native stock. This farmer has a heifer from her, which gives, as he supposes, 60 lbs. of milk per day. He gives an opinion, which, from his successful experience, certainly deserves attention; that heifers which "come in" with their first calf at two years old, do better than when their coming in is delayed until three years old. Their milking properties are in this way improved. Probably he is right in this matter; but the general experience of the best farmers recommends that, if a heifer comes in at two years old, she should not be allowed to have another calf, under at least eighteen months from this time.

The establishment of this farmer is substantial and independent. As far as the common comforts of life are concerned, little more seems to be desired. Good air, good water, plenty of bread, plenty of fuel, plain and substantial clothing made by the hands of his own family, and the product in a great measure of their own flocks and fields; an estate which he can call his own with truth, because it has been purchased not by fraudulent speculation upon other people's earnings, but by the healthful toil of his own muscles and the sweat of his own brow; luxuriant pastures filled with those beneficent animals, who are nourished by his kindness, and settle their bills in the most honorable manner every night and morning; and a clean dairy room of ample dimensions and exemplary neatness, with its numerous shelves, loaded with the richest produce, and speaking as well for the in-door as the out-door management; these features combined in this picture, present one of those beautiful examples of rural independence, and the bountiful rewards, with which a kind providence is pleased to crown industry, frugality, and good management, with which I am happy to say the county of Berkshire is every where sprinkled over, even on its high mountain summits, as well as on its fertile alluvions, and in its peaceful and secluded valleys. The independent proprietor of this establishment is now sixty-six years old. At the age of nineteen he was not the owner of a dollar. He now admits himself worth thirty thousand dollars; and all this, with the exception of less than fifteen hundred dollars, is the produce of his own farming industry, as he has never been engaged in any speculation whatever. A higher good than all this is found, in the fact, which he added with an honest pride and an enviable pleasure, that he had brought up eight children in habits of honest industry; and not one of them had ever disgraced his parents.

The standard of dollars and cents is a very imperfect standard by which to measure the prosperity of such a man. It is a prosperity which money cannot purchase, and money cannot measure. It is a prosperity flowing from deeper, purer, and more enduring sources; from a competency for the evening of life, earned by honest labor; a mind unembarrassed by the fear of want, and the vexatious caprices of trade and speculation; and a grateful sense of the kindness of that just and beneficent providence, whose blessings have rendered his peaceful and unpretending labors successful.

FEEDING AND FATTENING SWINE. APPLES AS FOOD.

From the same.

Of the swine of Berkshire county, there is little remarkable. I met repeatedly with a breed called the Mocho breed, which are much esteemed. I have found them in different parts of the state, but I can obtain no account of their origin. The Berkshire breed from England has been introduced into the county, and will extend itself as soon as its merits are properly appreciated. It is the best hog that we have among us; and when used as a cross with some of our small boned breed, such as the Byfield or the China, or the Mocho, the progeny is highly approved. In a cross with the grass breed, so common in New York, the produce is very fine. Beautiful samples of this cross have been produced on one of the best managed farms in Massachusetts, in Lexington, near Boston. The average size, at eleven and twelve months old, has been 300 to 350 lbs.; and with extraordinary care and feed they have been made to exceed 400 lbs. at ten months old. This early ripeness, in all animals designed for the butcher, is of great importance.

On the dairy farms, the raising of pork is extensively pursued, excepting where the whey itself is used for the cows. The expediency of using the whey for the cows, or, in preference, of keeping swine, is a vexed question among the farmers, which I have no means of determining. One hog is usually kept to four cows. A shoat, weighing seventy pounds in the spring, kept upon the slops of the dairy and pasturage, and some meal or potatoes, or both, may be expected, in the fall, to weigh 250 lbs.; and the farmers in general consider more than one hundred pounds of this produce as in justice to be credited to the four cows. This, I believe, is in most cases an under-estimate. No article can be given to swine, so conducive to thrift as milk, or the slops of the dairy.

One of the best establishments for fatting swine I found in Great Barrington. This farmer, whose whole management is excellent, fatted, the year before the last, twenty-four large hogs. The current year he has fatted twenty-five, and their average weight was 318 lbs.; total 7,950 lbs. His mode of fatting swine deserves attention. "As soon as the pastures will afford a good bite of grass, he turns them in where they can have plenty of clover and water. He is careful to salt them once a week, or oftener, if the season is wet; and changes them from one pasture to another, as he does sheep or other stock, which is of much importance through the summer. As soon as he gathers his harvest, he gives them the stubbles. When these are well gleaned, he gives them corn cut up by the ground for a few days as it is dangerous to keep them closely shut up and feed them highly in the beginning; having no exercise, it tends to produce the blind staggers. In order to remedy this, they must be put upon thin feed and have as much salt as they will eat. He commences steaming potatoes for his hogs the first of October, his ruta bagas not being then matured; he mashes them fine; puts nothing with them but the sour milk from six cows, and four quarts of salt to a box of twenty-eight bushels. This feed he continues three weeks. Afterwards, he commences steaming ruta baga, and continues this feed until the first of December, which is five weeks. He puts with the ruta baga, after being mashed fine, four quarts of salt and three bushels of oats and peas ground together, into a box containing twenty-eight bushels. On this feed they do extremely well. This feed he continues until the 25th of December; and then finishes off with meal and corn." The free use of salt is unquestionably of much advantage.

A very successful fattener of swine in another county, whose authority in this matter is decisive, is in the habit of boiling corn in a large vessel, and with the mixture putting in a few quarts of wood ashes. The proportions, I cannot exactly ascertain; but he considers its use once a day of great benefit to the health and appetite of his swine. He is careful likewise to put charcoal into their styes once a week. A finer stock of swine, or a finer display of fattening swine, I have never seen than I have seen at this farmer's place, which is certainly a conclusive test of the excellence of his management.

I have statements without number of the value of apples for feeding swine, In one case the gain upon raw apples was 11 pounds weight in 12 days; and in this case nothing excepting apples was used. The best form of using them seems to be to boil them with potatoes; and it is recommended by several farmers in this case to put the apples at the bottom of the kettle; and the potatoes become thus impregnated with their flavor. This comparatively new use and value of apples may be pronounced a great discovery of the most beneficial character. Many farmers, not accustomed to speak lightly, pronounce them of equal value as potatoes for the fatting of swine, for milch cows, and for beef cattle. I can answer for the human animal. There is no food more healthful or more nutritious, in reasonable quantities, than apples, cooked or raw. A dish of baked apples and pure milk is of all others the most delicious to the unadulterated taste; and the free use of apples and milk, in place of the miserable slops of tea and coffee, would give to the young bipeds of the family vigorous bodies and bright minds; abate a large item in domestic expenses; and prevent a taste for the two greatest and unalleviated curses with which humanity was ever visited, tobacco and rum,

THE TWIN, OR OKRA COTTON,

To the Editor of the Farmers' Register.

Columbia, March 26th, 1839.

* * * * * *

I have a new species of cotton, of which I will some day try and give you an account. I *know* too little yet to venture to give any thing for the public; but I will give you a very short account of what I do know.

A Mr. Terry, of Autauga county, Alabama, some years ago, bought some Petit Gulf seed. A single stalk was observed in a field, without limbs, and having great numbers of bolls adhering immediately to the stalk, or in clusters on very short limbs. The cotton had all been picked out except a single lock with nine seeds. From these seeds the variety has been propagated. The seed sold in 1837, at 50 cents a piece. Last fall I bought at $160, a bushel. The cotton examined by me exhibited a distinct variety. It had rarely any limbs longer than one joint, sometimes two; the bolls were two, three, and as much as seven in a cluster. I had one limb about four inches long, with seven good bolls opened on it. The stems of all of the bolls shooting from one place, at the top of the short limb. The cotton was exceedingly fine, being, I think, two to four cents a pound better; being in color and staple the finest and softest short staple I have ever seen. It opens earlier. The field I examined was planted the 20th April. A very intelligent gentleman, living in the neighborhood, told me he planted similar land on the 1st of April, and that the new cotton was open two weeks earlier than his. It grows in good land quite tall, say six or eight feet; and in this I fear, will be the greatest objection to it, as it may fall when heavily fruited towards the top; but perhaps this may be avoided by topping. Its advantage to an Alabama planter, if it succeeds in rich prairie lands, will be its early opening, by which the worm will be avoided, a terrible enemy, which has eaten up full one-third of my crops for five years. The appearance of the stalk is more like okra than any other—the leaf being a cotton leaf. If the "humbug" succeeds, I value it more than multicaulis, and will give you an account at some day. In the mean time, I remain very truly,

Yours, F. H. Elmore.

Greene, Ala., April 11, 1839.

Though Virginia is not a cotton growing state, and you consequently cannot feel the same immediate interest in our southern staple that you do in many other productions of the soil better suited to your climate, still, from the position you occupy before the agricultural public, and the interest you naturally feel in *all* things connected with the subject of agriculture, I flatter myself, a few seeds of a variety of cotton recently brought into notice, which I take the liberty of forwarding you, will not prove unacceptable. It is styled the "twin" or "Aldridge" cotton, taking its first appellation from the peculiar manner in which the branches originate from the stalk, I think, (for I have never seen it growing;) its second from the name of the gentleman who brought it before the public. Whence or how it originated seems to be a matter of doubt. Some saying that it accidentally, as it were, sprung up in a cotton field of Mr. Aldridge, the seed of which he carefully preserved—others that it was brought from Louisiana—&c. &c. All this is conjectural, and though evincing a pardonable curiosity, has but little to do with the intrinsic advantages of the article. Yet these have not been so fairly tested as positively to be determined. Those claimed for it, however, are its being better able to stand the effects of a drought, not casting the squares, however severe this may be; and from the extreme shortness of its branches, it will bear much closer planting; which, connected with the fruitfulness of each individual plant, render it a much more prolific variety than others. It is not contended that the staple is of a very superior quality. 'Tis said to grow with great rapidity. From its recent origin, small beginning, and the price of the seed, *fifty cents a piece, only*, its cultivation has been quite limited; and further experience is required to decide its fate. Whether it will eventually prove that it has been brought into notice, as the price would seem to indicate, for purposes of speculation, like many other articles, will ere long be determined. Yet, it is a singular variety, and I wish I could send you more of the seed, that you might give it a more extended test in Virginia; but I spare you more than half of a small parcel which a friend has just given me. There is no peculiarity attending its cultivation; and your climate no doubt is sufficiently favorable to promise success to your experiment—or, if it fail, it will be so limited as not to create any very *serious shock*.

The two foregoing extracts from private letters, seem to refer to the same new variety of cotton; and as each correspondent enclosed a few of the seeds, we shall be enabled to rear and compare the plants. Deeming the information as not only curious and interesting, but as promising much value to the agricultural interests of the south, we wrote immediately to ask leave of the first correspondent to publish his *preliminary* statement, in advance of the more full future information he had promised. This he kindly accorded, and therefore we are authorized to give, what is always so desirable, the writer's signature to his statement. Time did not permit a like application to the other and more remote correspondent; or leave would also have been asked of him to publish what he designed to be private; and, therefore, in *taking* the liberty, the name of the correspondent is withheld. The high authority which we attach to the opinions of both these gentlemen, offers to us a much better assurance of the superior value of this new kind of cotton, than the enormous price of its seed. Still, it would seem, there is no mode so effectual to introduce a new thing, whether it be of the most valuable kind, or the most palpable humbug and cheat, as to ask for it a price of the most unheard of enormity. If, according to the heretofore liberal and universal procedure of southern agriculturists, the first holders of this variety of cotton, had offered to *give away* seeds, or to sell them at merely a fully remunerating price, few persons would have cared to plant them. But by pursuing the contrary course, and asking 50 cents a seed, the anxiety to obtain them has probably been increased in the ratio of the advance of price. All this is well, if confined to real improvements; and if such cannot be introduced by operating by means of reason and sound precept, it is certainly desirable that it should be done by operating on the credulity and folly of the recipients. But, unfortunately, it has come to be considered that the high price asked for new seeds, &c., is *alone* sufficient evidence of their intrinsic value; and hence dupes are continually made by the vilest and grossest impositions that can be imagined. Thus Grant Thorburn's "Chinese corn," at 25 cents, and latterly $1 the ear, has been sold as readily as if its alleged superior qualities were supported by the most indisputable evidence, instead of by none whatever, except the price.

But let us not quarrel with the workings of folly, if they lead to wise and profitable results; and we may bear even that dupes should be made, (as they *prefer* this mode of instruction,) by the sellers of Chinese corn and multicaulis seed, in consideration that the same kind of folly will introduce and establish the culture of the Rohan potato, (recently selling at 25 cents the pound,) the okra cotton, (if it should be what it is supposed,) the morus multicaulis, and, what will be of incalculable value and importance to the country, the great industry of silk-culture. For our countrymen closed their ears to all arguments in favor of their entering upon this culture, until the plants to feed on rose to three cents the bud; and now, thousands are about to feed worms, induced at first solely by the high price of the morus multicaulis; and we entertain no doubt but that this most valuable culture will now be speedily and surely established.—Ed. F. R.

LOIN DISTEMPER IN HOGS.

To the Editor of the Farmers' Register.

March 30*th*, 1839.

In the November number of the Farmers' Register for 1838, I find a piece from the Tennessee Farmer, signed Parvus Agricola, entitled "loin distemper in hogs;" by which I suppose is meant the dragging of the loins and hind legs—not an uncommon disease with hogs. Why Agricola happened to stumble upon arsenic as a remedy for the above disease, I am at loss to conceive; unless indeed it was to rid the poor animal of his misery, and himself of further trouble, by his speedy death, which I suppose would have been the case, had it have acted on the hog as on most other animals; but with them it is said to be innoxious, and although harmless, as it proved to be, it certainly did no good. Now his other remedy "of pouring hot tar over the loins of the hog," has some reason with it, and to which probably he is indebted for the cure.

It is to guard the inexperienced against the indiscriminate use of so deadly a medicine as arsenic, and to suggest a very simple, as well as efficient mode of treatment for the said disease, which I have been long in the habit of pursuing, that I have been induced to notice the remarks of Parvus Agricola. My method of cure though, for ought I know, may be in common use, as it is very easily practised, and one that I should think would suggest itself to almost every observing man. But as we in Virginia, are in the habit of committing most of the minor details of our agricultural labors to others, the disease as well as the remedy, may have escaped the attention of the more reflecting, and of those most interested.

The dragging of the loins in hogs is occasioned, as I suppose, for I never dissected one, by a disease of the kidneys, which may or may not be occasioned by worms, as they are frequently found in that part of the animal; and the mode of treatment that I should think would most naturally suggest itself, would be to produce counter irritation on the surface, nearest the part affected. With this view, I make a small incision on each side of the spine, through the skin, just over the kidneys, and introduce into each incision one or two peas, beans, or grains of corn, as may be most convenient at the time, previously rolled in tar, and close the skin over them, thereby producing an issue over each kidney. The result has been, that in a few days the hog was restored to its legs again, and in a short time to its perfect health. This practice I have followed for some years, and in no instance have I seen it fail to produce a radical cure. An issue made in any other way would doubtless be equally efficacious. The above mode was adopted as the most simple that presented itself to my mind.

It was in this way, I presume, by pouring the hot tar over the loins of his hog, that Parvus Agricola effected a cure, and not by the use of arsenic; and conceiving mine to be the most simple and efficient remedy of the two, I have ventured to recommend it.

Should these desultory remarks be the means of prolonging the life of any good grunter, my object will have been attained; as, however grovelling an animal the hog may be in its nature, it it nevertheless one of the indispensibles of low-land Virginia husbandry; as a well stored smoke-house, and the contents freely used, makes honest and good negroes, to say nothing of other benefits and comforts derived.

A LOWLANDER.

PRICE OF MORUS MULTICAULIS SEED.

The 'Journal of Commerce,' of New York, gives the following as a remarkable example of high prices, and of the disposition of the public to pay them. But the intelligent editors of that paper did not mention, and probably were not aware of the most important item in the account, which makes the prices and the *dupery* both *transcendent*. This is, first, that neither these, nor any of the many pounds of seeds sold in this country as of the *morus multicaulis*, were grown on that variety of mulberry; and secondly, that even if they had been so grown, that the seeds would rarely, if ever, produce the same kinds as the parent tree.

"*Good Profits.*—A person last year received a small invoice of the morus multicaulis seed from Canton, which cost then about four dollars per pound. It was afterwards re-sold several times, at a constantly increased price, and a small parcel is said to have been sold at one hundred dollors the pound. The price has since abated a little, and the present market rate may be quoted at about eighty dollars the pound."

EFFECTS OF EMANCIPATION OF SLAVES IN JAMAICA.

From the Kingston (Jam.) Despatch.

We are getting on here terrible bad. The behavior of the negroes is enough to drive one out of his senses. The few that do turn out, do about one fourth of a day's work, and that for the most exorbitant wages—viz: 2*s*. 1*d*. for cutting canes in the fields; 2*s*. 6*d*. for wainmen; 3*s*. 4*d*. for cane carriers; 3*s*. 4*d*. for mill feeders; 2*s*. 11*d*. for green trash carriers; 2*s*. 6*d*. for dry trash carriers; 3*s*. 4*d*. for boilermen, and 3*s*. 4*d*. for stokermen. Some of the cane pieces not cleaned since last crop, and for crop of 1840, no prospects whatever. A few acres of cane-holes dug, but no body will plant; and even the late plants of the present crop (1839) have some of them not been cleaned since they were planted; consequently one half is dead, and the other so stunted from neglect, that they will not be worth the cutting; for instead of two hogsheads to the acre (which they ought to have given had they been attended to,) they will not, I suppose, give more than a barrel. It looks as if it was the intention of the negroes to take as much of this crop off as will suit their purposes, and let the rest rot, and make no preparations for any future one. When I say suit their purposes, I mean just to work as much as will supply them with what money they may require. Some of my principal hands are so busy planting pams in *their* grounds this week, that they have had not time to bestow a thought on the poor proprietor's produce.

"An estate in our neighborhood has struck work for two or three days past, and left about 40 loads of canes rotting in the mill yard, merely because rent had been demanded.

CARROTS.

From the Second Report of the Agriculture of Massachusetts.

Jeremiah Valet, late of Stockbridge, but now an emigrant to the fertile west, a true philosopher in a homely garb, a pure diamond, though never in the hands of the lapidary, (I would not say *this if* he were not out of the reach of my voice,) was much in the habit of raising carrots; and gave a preference to them over every other vegetable for fattening swine and cattle. This was the result of repeated trials and long experience. To fattng swine he gives them boiled; to store hogs, raw. His crops average 800 bushels to the acre.

Jno. Merrill of South Lee, has been a very successful cultivator of carrots. He states the yield on two acres at 600 bushels to the acre; and the cost of cultivation, exclusive of manure and rent of land, at 25 dollars per acre; or a little more than four cents per bushel. For feeding horses, he says, he should prefer one hundred bushels of carrots and one hundred bushels of oats to two hundred bushels of oats. He applied them in a raw state to the feeding of his team horses, and horses in preparation for market; and they were kept by them in high health and spirits. Oats followed his carrot crop on the same ground with great success. The experience of J. C. Curwen, Esq. in the use of carrots for horses, corresponds with that of Mr. Merrill. The authority of Curwen is unquestionable; and he was in the habit of employing constantly as many as eighty horses on his farm and in his extensive coal-mines.

"I cannot omit" he says, "stating the great profit of carrots. I have found by the experience of the last two years, that where eight pounds of oat-feeding was allowed to draft horses, four pounds might be taken away and supplied by an equal weight of carrots; and the health, spirit, and ability of the horses to do their work be perfectly as good as with the whole quantity of oats. With the drill husbandry and proper attention, very good crops of carrots may be obtained upon soils, not generally supposed suitable to their growth."

He adds in another place. "The profits and advantages of carrots are in my opinion greater than any other crop. This admirable root has, upon repeated and very extensive trials for the last three years, been found to answer most perfectly as a part substitute for oats. Where ten pounds of oats are given per day, four pounds may be taken away; and their place supplied by five pounds of carrots. This has been practised in the feeding of eighty horses for the last three years, with the most complete success, and the health and condition of the horses allowed to be improved by the exchange. An acre of carrots supplies an equal quantity of food for working horses, as sixteen to twenty acres of oats."*

My own experience of the value of carrots, which has not been small, fully confirms these statements. I have obtained at the rate of more than a thousand bushels to the acre on three-quarters of an acre; but on several acres my crop has usually averaged 600 bushels to the acre.

——Smith of Middlefield, Hampshire county, from three-fourths of an acre obtained 900 bushels.

Charles Knowlton of Ashfield, Franklin county, this year obtained 90 bushels on twelve rods of ground. This was at the rate of 1200 bushels to the acre.

D. Moore of Concord, Middlesex county, from six rods of land, obtained this year 56 bushels, or at the rate of 1493 bushels to the acre.

According to Josiah Quincy's experience in Quincy, Plymouth co. charging labor at one dollar per day, his carrots cost him eleven cents per bushel. David and Stephen Little, in Newbury, Essex county, in 1813, obtained 961 bushels to the acre, at an expense of $79 50 every expense included, excepting rent of land. This was at a rate less than nine cents to a bushel.

The great objection to the cultivation of carrots lies in the difficulty of keeping them while growing free from weeds. If sowed without any preparation, the seed is a long time in germinating; and a plentiful crop of weeds is liable to get possession of the land before the carrots make their appearance. There is another difficulty. The carrot seed, from its minuteness, is liable to be sowed too thickly. To obviate in a degree these objections, let the ground be ploughed deeply, well manured, and put in fine tilth; and let the first and perhaps the second crop of weeds be ploughed in. After this, let the land be thrown into ridges two feet apart, and the seed sown on top of the ridges either in a single line, or the ridges be made so wide as to receive two rows of carrots, eight inches or one foot apart. In the mean time the seed should be freely mixed with fine sand; and the sand kept so moist that the seed shall germinate. As soon as it is sprouted it should be sown. This may be so arranged that the sowing shall take place about the first of June. They will then have the start of the weeds. The mixture with sand will prevent their being sown too thickly. After the first thinning and weeding is over, if done with care, the battle may be considered as won. Afterwards let them be cultivated with a plough or cultivator and kept clean. When the time of digging arrives, the work will be greatly facilitated by passing a plough directly along the side of the carrots; and they are easily thrown out by the hand.

For the Farmers' Register.

MONTHLY COMMERCIAL REPORT.

The apprehensions of political disturbances, which lately existed, are happily dissipated, and the recent accounts from Europe, per steamer Great Western, show a favorable state of markets there for tobacco and cotton, but not for grain and flour. Prices with us are influenced accordingly. In tobacco there is some advance, but the range of quotations is still $6 to 16, and occasionally higher for very choice quality. The quantity brought in for inspection is increasing as usual at this period of the season.

Considerable sales of cotton have been recently made at 13½ to 14½ cents, and some choice quality at 14¾ to 15. The crop of the United States, it is now confidently believed, will fall short of 1,500,000 bales. Prices in this country are higher than the last quotations from Europe warrant; shippers therefore must calculate on a further advance there.

Large sales of flour were made in Richmond some ten days ago, at $6 75; but this price cannot now be obtained, and the quotation is $6 56 to 6 62. Even at this decline in price it is not probable that shipments will be made to England, from an apprehension that the duty there will advance.

Wheat commands $1 40 cents; corn 80 to 85 cents. Exchange on England 8½ X.

April 26, 1839.

☞ Subscribers are respectfully requested to read the conditions of publication, at the latter part of this number; and all of them who have not already done so, are again invited, and requested, to make use of the privilege offered to them in the second and third articles.

CONDITIONS OF THE FARMERS' REGISTER.

For Vol. VII. Prices still more reduced, for punctual or advanced payments.

I. The Farmers' Register is published in monthly numbers, of 64 large octavo pages each, and neatly covered, at $5 a year, payable in advance. Or, for $5 may be had *two copies* of the same current or forthcoming volume, for *new subscribers*, if so ordered and paid for in advance, (or at the time of making the subscription,) in current money, (as described below,) and without loss or deduction for postage, or any other charge to the publisher.

II. Subscribers now on the list, who have already paid the regular subscription price of $5 in the manner above required, for a single copy, shall have the privilege, upon sending a *post-paid* order, of having a second copy of the same volume sent to any NEW subscriber, without further charge, for that volume.

III. A like privilege will be allowed to every old subscriber who has not yet paid, but who shall do so, as above, before the issue of the 12th number of the 7th volume; thus in effect REDUCING TO HALF PRICE THE COST OF THE WORK TO EVERY SUBSCRIBER, OLD OR NEW, WHO MAY CHOOSE TO AVAIL OF THE OFFER.

IV. If, however, no more than one copy is ordered, the subscription price will still be, as heretofore, $5 the volume; as it is not designed to permit any subscription debt, or payment, to be made for less than $5. And if an order is sent for two copies, without compliance with the conditions annexed, only one will be sent.

V. The price of back volumes, as heretofore, is $5 for one alone, $10 for any three together, and in the same proportion ($3.34 cents for each,) for any number of volumes; except that vol. I., is to be furnished only as part of a full set.

VI. ALL MAIL PAYMENTS MUST BE MADE IN NOTES, OR CHECKS, OF PAR VALUE IN VIRGINIA, or of a CITY and SPECIE-PAYING bank of the state in which the subscriber resides.

VII. The risk of loss of payments for subscriptions, sent free of postage, which have been properly committed to the mail, or to the hands of a postmaster, is assumed by the editor.

VIII. All letters to the editor in regard to the Farmers' Register must be post-paid—except such as contain articles for publication.

IX. If a subscription is not directed to be discontinued before the first number of the next volume has been published, it will be taken as a continuance for another year. Subscriptions must commence with the beginning of some one volume, and will not be taken for less than a year's publication.

X. The mutual obligations of the publisher and subscriber, for the year, are fully incurred as soon as the first number of the volume is issued; and after that time, no discontinuance of a subscription will be permitted. Nor will a subscription be discontinued for any earlier notice, while any thing thereon remains due, unless at the option of the editor, (or in obedience to the regulations of the Editorial Convention, copied below.)

XI. For all copies not received by mail, at the proper post offices, duplicates will be furnished to those subscribers *who have complied with their own obligations;* provided that the failure *shall be notified through the postmaster,* and *within two months after the date of the miscarried copy.*

Petersburg, Va., Jan. 1st, 1839.

General Regulations adopted by the Editorial Convention.

The following resolutions of the Editorial Convention of Virginia, will hereafter form part of the Conditions of the Farmers' Register, and will be strictly observed.

1. "All subscriptions shall hereafter be considered as incurred and due in advance, and for a year's publication, unless specially ordered for a shorter time, and paid for in advance for that shorter time, when so ordered.

2. "No publication shall be sent to the order of any new and unknown subscriber, unless paid for in advance, or satisfactory reference be made to some known and accessible person in regard to the subscriber or his payment. But, in case of an order for a publication, without payment, from a new subscriber who is unacquainted with the conditions, a single number may be sent, containing, or accompanied by, a copy of this regulation.

3. "The names of all subscribers, whose ability to pay may be unknown to the publisher, and who may remain indebted on open account at the end of two years, from the time when the advanced payment was due, shall be erased from the list of subscribers."

[*Resolutions of the Editorial Convention of Va.*

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ERRATUM.—Page 237, line 9, for "*manure*" read "*measure.*"

PRICES CURRENT--April 27, 1839.

COUNTRY PRODUCE.

Wheat,	$1 40 to 1 50	Tobacco,	$6¼ to $15¼
Flour, (superfine)	6 50 to 7	do. (lugs)	$5¼
Corn, per bushel 55 cents,		Bacon, (hog round)	11 cts.
Cotton,	13 cts. to 15		

BRANCH, WINFREE & Co.

MORUS MULTICAULIS AGENCY,

RICHMOND, VIRGINIA.

The subscriber offers his services to the growers of the Morus Multicaulis, as an agent for the purchase and sale of trees by contract, deliverable next fall. Persons disposed to purchase or to sell, will please communicate with the subscriber, who will give the most unremitted attention to any instructions received.

Much experience and familiarity with the subject, added to a very general personal acquaintance with the growers of the mulberry, will enable the subscriber to render very valuable and profitable service to those who may wish to operate through an agent.

JAMES WINSTON,
Richmond, Va.

P. S. Silk Reels and other Silk Machinery—Silk Worm Eggs and Cocoons, will be received for sale, or orders therefor executed.

N. B. Many of the Morus Multicaulis will be cultivated in the vicinity of Richmond this year, and with so much assiduity they will no doubt range from three to eight feet and more.

Refer to L. J. Cox, } *Baltimore.*
Gideon B. Smith, }
Philip Physick, } *Philadelphia.*
M. S. Powell, }
Saml. R. Gummere, *Burlington N. J.*
Geo. Olmstead, *East Hartford, Conn.*
Horace Pitkin, *Manchester, Conn.*

April 30—n12t

THE MARYLAND

SILK COMPANY,

OF BALTIMORE,

Offer for sale

50,000 Morus Multicaulis, or Chinese Mulberry Trees.
10,000 Alpine Mulberry Trees, selected with care.
5,000 Canton do. do.
5,000 Rose of Lombardy do.
10,000 Other varieties. Apply to

LUTHER J. COX, Pres't.
Commerce street, Baltimore.

March 21.—tf

DURHAM BULLS.

The subscriber offers for sale, two very superior improved thorough-bred SHORT-HORN DURHAM BULLS, (viz:)

HECTOR, red and white, 4 years old, bred by Gen. Stephen Van Rensselaer of Albany, state of New York, by *Ajax*, (who was by imported *Washington*, bred by Mr. Champlin of England,) (his dam Red Lady, out of imported Fancy,) dam Lilly, g. dam Beauty, g. g. dam Red Lady, who was out of imported Fancy.

YOUNG BOLIVAR, red and white, 2 years old, by Old Bolivar, (bred by J. Whitaker, Esq. of England, and one of the largest and highest formed animals, and of the purest pedigree ever imported by that noted breeder Col. Powell of Philadelphia,) his dam Young Sprightly, who was out of Old Sprightly, and she out of imported Fancy. See Herd Book in regard to all. They are both in high health and vigor, and of fine size and form, and may be seen on my Estate, Sabot Hall, Goochland county. For terms apply to

BERNARD PEYTON,
Richmond.

April 30—n. 1t

VIRGINIA SILK AGENCY.

The subscriber respectfully informs those engaged in rearing silk, that he has opened an office over the store of Messrs. James M. Radcliffe, & Co., Main street, for the purpose of attending to the silk business in all its various branches, viz.: will purchase, or dispose of for account of the growers, cocoons and silk in all stages, as soon as rates can possibly be fixed; and now offers for sale, Mammoth white, grey, and yellow, two crop white, and six weeks yellow ball silk worm eggs. A supply of Piedmont reels expected by the reeling season. ALSO,

Two millions of trees and ten millions of buds, warranted genuine morus multicaulis, now growing in various sections of the state, deliverable on 1st November next, in lots to suit purchasers, the best security will be given for every sale, and the same required.

All communications must be post paid.

J. H. D. LOWNES,
Richmond, Va.,
Agent for the planters.

References.—Dunlop, Moncure, & Co., Lancaster, Denby, & Co., Richmond, Va.

April 30—n&atf

UTILITARIAN,

BY ECLIPSE.

THIS HORSE has been carefully bred with an eye to the useful qualities for the road. The excessive and extravagant estimate put upon the qualities for the turf, (there can be but little doubt,) has produced the present scarcity of fine saddle horses in Virginia.

The leading object of breeding ought to be to produce a race of horses the best suited to the useful and necessary purposes of life. Utilitarian is offered to the public as being worthy of the patronage of such gentlemen as may desire to propagate that class of the noblest of our domestic animals—the sharer and companion of our sports—the aid in our healthful exercises, and the indispensable auxiliary in many of our most important labors, the saddle and the harness horse.

This horse will stand the ensuing season, to commence the 1st April, and end the 15th July, at Bremo, in the county of Fluvanna, and will be limited to 25 mares, (with the privilege reserved of adding five more, without charge, except for feeding, provided five mares of established character as breeders are offered,) at $25, with one to the groom—each to be insured. Mares will be fed at 25 cents per day—pasturage gratis—but no liability for accidents or escapes. The season to be due when the mare is known to be in foal, or is parted with.

Utilitarian is six years old this spring; a fine bay, with no other white about him except a narrow stripe around the coronet of his off hind foot, and a spot in the forehead the size of a dollar. He is 16 hands high; and while he is of the purest blood, which is doubtless essential to every first rate horse of all work, he has the stoutness of limbs and muscular powers of the hunter, with the fine action (to a considerable extent,) of his grand-sire on the dam side, who was incomparably the finest pacer and the most perfect model of saddle horse I ever knew.

PEDIGREE.

Utilitarian was got by American Eclipse; his dam by Roebuck, his grand-dam by the imported Bedford, and his great-grand-dam by imported Diomed, out of the imported mare Jennette; for whose pedigree, see the English Stud Book.

Address, Winnsville Post Office, Fluvanna county.

March 31.—n3t JOHN H. COCKE.

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DURHAM CATTLE FOR SALE.

The subscriber offers for sale a full bred Durham bull, six years old this month, bred by John H. Powell (near Philadelphia,) and equal to any he ever raised. His pedigree is in my possession and may bes een by any one wishing to purchase

ALSO,

A bull calf of three-fourths blood, and two cow calves, one of seven-eighths and the other of three-fourths. WINTER BRAY.

Near Tappahannock, Essex, Va.

Feb. 28th, 1839.—n3t.

FORWARDING

By the Richmond & Petersburg

RAIL-ROAD.

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Richmond, Feb 1.—n. tf

AGRICULTURAL BOOKS

FOR SALE AT THE

Office of the Farmers' Register.

The following publications are for sale at the Office of the Farmers' Register, and will be sent by mail, or otherwise as required, at the following prices, upon *cash* and *post-paid orders.*

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April 30, 1839.

Haller Nutt Esquire
Rodney
Missi

THE

FARMERS' REGISTER,

A MONTHLY PUBLICATION,

Devoted to the Improvement of the Practice

AND

SUPPORT OF THE INTERESTS OF AGRICULTURE.

EDMUND RUFFIN, EDITOR AND PROPRIETOR.

Vol. VII. MAY 31, 1839. No. 5.

> And he gave it for his opinion, "that whoever could make two ears of corn, or two blades of grass, to grow upon a spot of ground where only one grew before, would deserve better of mankind, and do more essential service to his country, than the whole race of politicians put together."
> *Swift.*

PETERSBURG, VA.
PUBLISHED BY THE PROPRIETOR,
1839.

[This publication consists of four sheets—postage for 100 miles or less, 6 cents—over 100 miles 10 cents.]

Subscribers in arrear will please look here on next No. (6th) for a notice of the amount then due from each.

LIST OF PAYMENTS FOR THE FARMERS' REGISTER, MADE BY SUBSCRIBERS, OR PURCHASERS, FROM MAY 1st. TO MAY 30th, 1839.

PAYMENTS FOR VOL. II.

Joseph Rives	Brunswick, Va.
James Waddille	Murfreesboro', N. C.
H. W. Braden	Tallahassee, Fl.

PAYMENTS FOR VOL. III.

James Waddille	Murfreesboro', N. C.
H. W. Braden	Tallahassee, Fl.

PAYMENTS FOR VOL. IV.

James Waddille	Murfreesboro', N. C.
H. W. Braden	Tallahassee, Fl.

PAYMENTS FOR VOL. V.

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PAYMENTS FOR VOL. VI.

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Richmond, Feb 1.—R. tf.

THE FARMERS' REGISTER.

Vol. VII. MAY 31, 1839. No. 5.

EDMUND RUFFIN, EDITOR AND PROPRIETOR.

STATEMENT OF THE COST AND PROFITS OF AN EXPERIMENT IN FEEDING HOGS.

To the Editor of the Farmers' Register.

Philadelphia, April 20th, 1839.

When agricultural experiments are fairly and carefully made, and their results recorded, I think they have great value, (let the results be what they may,) for which reason, I send you the following account of the cost of buying, raising, and feeding a lot of hogs, and the value produced. I am encouraged so to do because I have every confidence that implicit reliance may be placed in the statements of my friend who furnished me with the account. It was not prepared for publication, but was sent to me in the course of a familiar correspondence. I have lately mentioned to my friend my wish to send it to you. He did not object, but as he did not specifically authorize me to attach his name to it, I must send it without. I will mention, however, that he is one of the most successful pupils of the late George H. Walker, and that he is doing much to improve his farm, which is in New Jersey. Peter Hulme.

I herewith send you an account of expense and profits arising from feeding hogs, as taken from memoranda strictly kept. These porkers were fed with my own hands from beginning to end, and all their feed was measured and charged by myself; so that you may rest assured, upon my responsibility, that every thing is as correct as possible.

I am convinced that had I had a good breed, instead of one of the worst, I should have been the gainer by at least one-third. But as it has turned out, it is decidedly preferable for a farmer (removed from market,) to feed away all his grain than to sell it. As I fed my hogs a great deal on boiled food I went to the expense of purchasing wood, although I had sufficient on my farm, that no expense might be incurred without being justly charged.

As I killed my hogs very early, their weights are not heavy—another loss; as I now consider the longer a hog is fed, (if he is a good feeder,) the more profit. That is, when a hog becomes lazy with fat and is inclined to spend all his time, except while eating, in lying about and sleeping, he puts on more fat than in the early stage of feeding, when he uses a good deal of exercise. However, as I intend next year to feed my porkers till they become something worth looking at, and as I shall still keep an account with them, I shall be more fully prepared to speak positively on this question. The fact is, every farmer who wishes to try experiments in feeding, should have some means of weighing his cattle weekly, so that he might tell to a certainty whether he was making or losing money, as well as what food was the cheapest, or rather, gave the most nourishment. There is entirely too much guess work in all our operations, which must be the case until study, capital, and liberality in the use of money, are united to our exertions.

As it is not necessary give you a list of every purchase, I will set down the cost of hogs, the expense of food, wood and pasture; and give you items of credit in pork, shoats, lard, &c.

This account is somewhat lame as respects the worth of the pasture and manure. My hogs fed until harvest on three acres of ground covered thickly with trees, (an apple orchard, trees forty feet apart, interspersed with peach trees,) which owing to the dry summer, would not have netted me $10 per acre in any other crop, and which I consider a fair valuation for the pasture. After harvest they had the run of a fifteen acre field. The after-math you may value at what you please. It was of no use but to pasture, and I do not consider that farmers ought to take it into consideration, as it is the only way it can be applied; and I doubt not, the manure left upon the land well pays for the pasture eaten. However, to sum up the whole concern, I think the manure in my barn yard made by the hogs, worth a great deal more than the use of the land before harvest and all the grass after. I would not take, at a rough guess, $75 for my hog dung. Their pasture before harvest consisted of white clover; (the field had been idle two years and covered itself with grass,) after harvest they had the run of a stubble field for three weeks; and after that red clover pasture. During their pasturing, which was from May 5th to September 3rd, they had no drink but water, with the exception of my small pigs, which had, in addition, after they left the sows, a weak swill, the slops of the house and Indian corn and oats ground together. I had not much milk to spare, as I only keep five cows, and have a large family to consume a great deal of that article. The feed of my hogs, from the commencement until killing, was entirely merchantable food—corn, oats, rye, bran, and oil cake, and charged at a price I should have had to give for those articles if I had bought them.

On the 9th of March, 1838, I purchased nineteen hogs at a vendue, for which I paid $100. Four of them gave me twenty pigs on the 12th and 13th of April. On the 19th March, I brought home a sow and eight pigs, three days old, for which I paid $14. The eight pigs I killed this winter for my own use, the weight of which I will give you presently. Besides this, one of my sows stole a bore and had six pigs on the 27th of June.

Now the whole cost of hogs, first cost and feed, (excepting pasture,) until killing time, amounts to the sum of - - - - $494 91½

My credits are as follows:

1838, By 38 lbs. pig pork, eaten by the family at 9 cents,	$3 42
Dec. 6, by 20 hogs, wt. 4617 lbs. at 9c. - - -	415 53
8, by 93 lbs. gut lard, at 14c. - - -	13 02
11, by 50 lbs. pig pork, at 9c.	4 50
15, by 5 shoats sold alive,	14 30
31, by 3 do do,	7 50
1839, Jan. 15, by 9 spring pigs, wt. 1706 lbs. at 9 cents,	153 54

Jan. 16, by 36 lbs gut lard, at 14c. - - - -	5 04	
16, by 16 shoats,(on hand,) valued at $4 each,	64 00	
		$680 85
By balance credit,		$186 93½

So you see I have been paid a market price for all my food, and received $185 93½ for profit.

January 23th, 1839.

THE DAGUERROTIPE.

From the New York Observer.

The following is an extract from a private letter of Professor S. F. B. Morse to the editor of the Observer, dated, Paris, March 9th.

"You have perhaps heard of the Daguerrotipe, so called from the discoverer, M. Daguerre. It is one of the most beautiful discoveries of the age. I don't know if you recollect some experiments of mine in New Haven, many years ago, when I had my painting room next to Prof. Silliman's experiments to ascertain if it were possible to fix the image of the Camera Obscura. I was able to produce different degrees of shade on paper, dipped into a solution of nitrate of silver, by means of different degrees of light; but finding that light produced dark, and dark light, I presumed the production of a true image to be impracticable, and gave up the attempt. M. Daguerre has realized in the most exquisite manner this idea.

"A few days ago I addressed a note to Mr. D. requesting, as a stranger, the favor to see his results, and inviting him in turn to see my Telegraph. I was politely invited to see them under these circumstances, for he had determined not to show them again, until the Chambers had passed definitely on a proposition for the government to purchase the secret of the discovery, and make it public. The day before yesterday, the 7th, I called on M. Daguerre, at his rooms in the Diorama, to see these admirable results.

"They are produced on a metallic surface, the principal pieces about 7 inches by 5, and they resemble aquatint engravings, for they are in simple chiaro oscuro, and not in colors. But the exquisite minuteness of the delineation cannot be conceived. No painting or engraving ever approached it. For example: in a view up the street, a distant sign would be perceived, and the eye could just discern that there were lines of letters upon it, but so minute as not to be read with the naked eye. By the assistance of a powerful lens, which magnified 50 times, applied to the delineation, every letter was clearly and distinctly legible, and so also were the minutest breaks and lines in the walls of the buildings and the pavements of the street. The effect of the lens upon the picture was in a great degree like that of the telescope in nature.

"Objects moving are not impressed. The Boulevard, so constantly filled with a moving throng of pedestrians and carriages, was perfectly solitary, except an individual who was having his boots brushed. His feet were compelled, of course, to be stationary for some time, one being on the box of the boot-black, and the other on the ground. Consequently, his boots and legs are well defined, but he is without body or head, because these were in motion.

"The impressions of interior views are Rembrandt perfected. One of Mr. D's plates is an impression of a spider. The spider was not bigger then the head of a large pin; but the image, magnified by the solar microscope to the size of the palm of the hand, having been impressed on the plate, and examined through a lens, was further magnified, and showed a minuteness of organization hitherto not seen to exist. You perceive how this discovery is, therefore, about to open a new field of research in the depths of microscopic nature. We are soon to see if the minute has discoverable limits. The naturalist is to have a new kingdom to explore, as much beyond the microscope as the microscope is beyond the naked eye.

"But I am near the end of my paper, and I have unhappily to give a melancholy close to my account of this ingenious discovery. M. Daguerre appointed yesterday at noon to see my telegraph. He came, and passed more than an hour with me, expressing himself highly gratified at its operation. But while he was thus employed, the great building of the Diorama, with his own house, all his beautiful works, his valuable notes and papers, the labor of years of experiment, were, unknown to him, at that moment becoming the prey of the flames. His secret indeed is still safe with him, but the steps of his progress in the discovery, and his valuable researches in science, are lost to the scientific world. I learn that his Diorama was insured, but to what extent I know not. I am sure all friends of science and improvement will unite in expressing the deepest sympathy in M. Daguerre's loss, and the sincere hope that such a liberal sum will be awarded him by his government, as shall enable him in some degree at least, to recover from his loss."

In the same vessel which brought the above letter, the writer himself arrived. From him we have received some additional information respecting this very interesting discovery, which we cannot at present communicate. We have only room to say, that we are even more impressed with the value of the invention as a means of procuring, without labor or expense, perfect and satisfactory panoramas of all the most interesting places and scenery on the globe, and, if we apprehend its power correctly, perfect representations of the human countenance, than with its power to reveal the secrets of "microscopic nature." With what delight will the eye dwell on the panoramas of Jerusalem, Thebes, Constantinople, Rome, and other cities of the old world, delineated with unerring fidelity by the Daguerrotipe? With what interest shall we visit the gallery of portraits of distinguished men of all countries, drawn, not with man's feeble, false, and flattering pencil, but with the power and truth of light from heaven! It may not be long before we shall witness in this city the exhibition of such panoramas and such portraits.

ON CORN AND ITS CULTURE.

For the Farmers' Register.

I was particularly interested in that part of Mr. Garnett's late address, which relates to Indian corn, he rightly remarks, that though it has been so long cultivated, much still remains to be learnt in relation to this valuable plant. If the perpendicular roots of Indian corn escaped his observation for half a century, it is not to be wondered that they never attracted mine, whose experience is much more limited. The progress of the arts are slow. Some of them now seem to be under the spur; but agriculture has proceeded at "snail's pace."

Many of our American writers who have written books, have been gentlemen agriculturists without practical experience, and who have run greatly into theories and speculations. Among practical farmers, ancient habits and maxims have been adopted without reflection, and when once fixed are seldom changed. The three-field system, which has been the ruin of our lands, has still fast hold in our country, and perhaps may wear out in twenty years to come. I had heard some of our old farmers say, that for Indian corn, surface cultivation was the best; and this year for the first time, I have broken the ground to the depth of the soil, for corn cultivation. Perhaps the manifold lateral roots thrown out by a stalk of corn, may, in some degree, be attributed to the perpendicular roots being obstructed by the hard ground below a superficial cultivation. A beet or parsnip will not make a good root, unless the ground be deeply stirred before planting, but will throw out fibres; and as a means for aiding the growth of the perpendicular roots in one of my corn fields, I am now crossing with a coulter plough, and should I find my crop improved, and I live till next year, I will use it generally in my corn cultivation.

I apprehend that there can be no universal rule for the cultivation of Indian corn. A sandy soil, a friable mould, and a stiff clay, require very different treatment. Much too depends upon the season; but there are certain points in relation to it, which I have settled for myself, though I am still open to better instruction.

I prefer the twin corn, believing that on improved lands, it will afford the largest production; the grain compared with some other varieties is defective in weight and solidity. I am now growing on one of my farms a corn of better quality, which by careful selection, I apprehend in a few seasons more will be a superior twin corn. My second proposition is, that corn ought to be planted, cleaned, and thinned as soon as the season will permit. Our severe drought generally occurs between the 20th of July and the 20th of August; and when the stalk has attained its full growth, it is not so much injured by want of rain as in its growing in a tender state. If I possessed Mr. Espys' secret, of procuring rain at pleasure, I should prefer late planting. My third is, that wheat ought never be sown among corn if the land is equal to profitable production; it is generally necessary to give it a late ploughing, preparatory to sowing wheat, which seldom fails to injure the corn. My last is, that corn ought never be stripped of its fodder; the reasons for which may be found in the pages of the Register.

I have always supposed that the best seed-corn was that which from experience had been found best suited to the climate; a northern corn has been tried here called the Dutton corn, without success. To the north six or seven stalks are generally left in the hill, to compensate for the smallness of the ear: cultivated in this manner here, in a favorable season it will fire, and last year the failure was entire. We find the twin corn to be later than our common gourd-seed, but is sufficiently early to escape the frost. I some years ago sent some of it to one of my friends in Bedford county, Pa., and he informed me that it was much too late for the climate. It appears from a communication made to the Register by Doctor Archer, that it ripens early at Old Point Comfort. These facts do establish that corn suitable to the south, will not answer for the north and *e converso*. Commissioner Ellsworth, by a letter of the 12th of December, 1837, addressed to the editor of the 'Farmer and Gardener,' recommends the Baden corn for its great product to the south and west, and speaks of its being grown advantageously as far north as 45. This letter covered a statement from Mr. Baden, representing it to be early in its growth, and producing four to eight good ears to the stalk. A corn so prolific, and which was equally suitable to the shores of the St. Mary's, and the banks of the St. Laurence, would have been of great value to our corn growing states, and might have cured some of us of our hankering for the cotton and sugar regions.

I have now a letter before me from one of the most experienced and successful agriculturists in Fairfax county, Virginia, who state the Baden to be a corn which ripens late there, and for other reasons to be the worst he ever grew. The Baden corn has been grown on this shore, with as little success as in Fairfax. The high station and high character of the Commissioner forbids the suspicion that he was concerned in the profits of this humbug; I am willing to consider him only the instrument of dupery, and only remark that a gentleman who stands officially at the head of the arts, ought to be careful how he sanctions with his high name a representation which leads to injury he cannot repair. Farmers are generally a simple, confiding race, who look with much respect to high men in high offices. Sir Robert Walpole, the great English minister, used to say of them, when brought up to be taxed they were as mute and submissive as sheep under shearing; but that merchants and manufacturers, under the same operation, fought and squealed like pigs.

RUSTICUS.

E. S., Md., 17*th April*, 1839.

SHAKERS' ESTABLISHMENTS.

From the Second Report of the Agriculture of Massachusetts.

In a survey of the agriculture of Berkshire, it would be inexcusable to pass over these establishments.

1. The family at Tyringham consists ordinarily of one hundred members. The farm is understood to contain more than one thousand acres, principally situated on the side of a high hill, and running down into the valley, where it is crossed by the small stream called Hop brook, which empties into the Housatonic river at South Lee. The view from this eminence, as the prospect extends towards the northwest, embracing the village of Lenox, "set upon a hill," with the whole intervening valley of a diversified aspect and luxuriant soil, the little manufacturing bee-hive of South Lee,

and the many rich summits every where scattered in the background of the picture, their tops and sides fringed with the chesnut and the rock maple, and the noble pile of Saddle-Mountain lying in the distant perspective like a contemplative giant in his repose, is among the most beautiful of those enchanting views, which are constantly opening upon the traveller, in this picturesque region.

The principal object of their farming, at Tyringham, is the raising of stock; neat cattle especially. Their dairy is well managed; and they have a garden of four or five acres, devoted to the raising of garden seeds and medicinal herbs, under skilful and successful cultivation. Their annual sales have sometimes amounted to $3,100; and they allow to their agents twenty-five per cent. commission on sales, and take back what is unsold. They produce some wheat, corn, and oats; and they are now effecting with great labor and admirable skill the redemption of extensive alluvial meadows on Hopbrook, by draining, rooting out the stumps, and cultivating the soil, which will bring these lands under a course of most productive improvement.

Of the religion of this peculiar people, it is not for me in this place to speak. A religion which holds the severest restraint over appetites and passions ever liable by their excess to lead men astray, which encourages industry, frugality, mutual love and kindness, and that which is certainly not lowest in the scale of virtues, the most exemplary neatness and order in every thing, is so far entitled to respect and commendation, Under whatever aspect we view it, we have at least occasion to congratulate ourselves, that we live under a government tolerant to every honest difference of worship and opinion; and to remember, that the same principle, which secures freedom to ourselves, should guarantee to others a like boon.

2. The establishment of the brethern at Pittsfield and Hancock, consists of about seven hundred acres, lying together; and is possessed by three large families, containing upwards of three hundred individuals. They are united for all the the general purposes of their society; but in their financial concerns are as families separate from each other. The land is not of the best description, being low, cold and wet; and their attention is mainly directed to the cultivation of grass and garden seeds, and the keeping of cows and sheep. Their first purpose is for their own supply. They raise the best they can, and they eat the best they raise; and though from their temperate and careful habits their thrift is remarkable, yet the accumulation of property is evidently not a principal object with them. They have various mechanical contrivances by which their labor is abridged or lightened. They have made the best use of water-power which their place furnishes, and husband it with care and economy. They have an extensive saw-mill carried by water, and all their fuel is cut in the same way. A simple arrangement which it may appear trifling to mention, impressed me by its shrewdness and good judgment. Ordinarily, fire wood is piled horizontally, and when exposed to the weather, becomes water soaked and mouldy. Their billets of wood, being sawed, were stacked up in convenient piles, the sticks being placed upright on the end, so that any water which fell upon the pile was immediately drained off. After being sawed, they were neatly put up under cover.

I have already referred to their magnificent barn, built of stone, of a circular form three stories in height, ninety-six feet in diameter, and capable, as well as may be calculated, of containing from three to four hundred tons of hay. The carts enter in the second story; the floor or drive-way is continued round by the wall for the whole of the circle, so that the cart passes round the entire distance, and when the hay is discharged, goes out at the same door at which it entered. All the hay is deposited in the centre. Several loaded wagons may stand on the floor, and be sheltered and unloaded at the same time. The roof is a beautiful and curious specimen of carpentry, and appears to be most securely supported. In the centre of the floor, there rises to the apex of the roof a single column as large as an admiral's mast, around which a hollow frame of slats is fixed, and which serves as a ventilator or chimney to discharge the steam of the hay. It is open at the top, and protected by a small cupola against the rain. At the same time the hay is raised from the ground, about a foot, by an open floor of slats, so that there is, while the hay is new, a constant circulation of air up this chimney; and one of the friends informed me that the steam passing from the hay in this mode was oftentimes so dense, that, to use his own expression, "you could wash your hands in it." The arrangements for the cattle are in the lower story, where every animal has its place and number, and where every cow is designated by a label on the post as in milk or otherwise. In this circular form, there is of course a considerable loss of room; yet the method of feeding is easy; the place is kept clean; the whole arrangements are convenient; and the kindly treated animals standing around this huge mass of hay, have at least the pleasure of seeing the good things in store for them. These friends have singular advantages, in the amount of labor which they are able at any time to command, and apply to any object which they have in view; and their establishment presents a beautiful illustration of advantages of well-directed industry, neatness, and order. The great rule of domestic economy, "a place for every thing, and every thing in its place," is nowhere more strikingly exemplified; and though they make no pretensions to the fine arts, and have little of what is called taste, yet all their arrangements, and the products of their labor, exhibit the proofs of thoroughness, permanency, utility, and substantial comfort.

Their dairy is exquisitely neat in every part of it. Their piggery is the exclusive concern of a single individual; and illustrates the utility in a large concern of a division of labor and of individual responsibility. They have attempted an improvement of their neat stock, by the introduction of some of the improved breeds, and the young stock which they were raising from this cross, promised extremely well, though no opportunity had been had to test its qualities for milk. Their land is considered in a great measure unfavorable to the production of grain; and a large portion of their bread-stuff therefore is purchased. They have likewise occasionally hired extensive tracts of meadow on the Mohawk river in the state of New York, which they have cultivated by colonies, in order to obtain brush for the manufacture of brooms, a branch of business which heretofore they have carried on to a considerable extent. They keep a large flock of sheep; and all their woollen fabrics are manufactured among themselves. They likewise are very extensively engaged in the raising of garden seeds, which are put up in a very neat manner, as is well known, and distributed over the country.

A three story brick building or college, erected for one of their families, is most remarkable for its neatness and the excellence of the materials and workmanship. What by the the "world's people," is called taste, that is a study of symmetry and beauty in the forms of objects, is studiously abjured by this remarkable community. Yet in the perfection of finish, which they bestow upon every production of their mechanical industry, they show that native perception of fitness, order, and harmony, which constitute the elements of the most cultivated and refined taste. The same amount of expense and labor, of which they are never sparing, already devoted to the construction of their buildings and the arrangement of their grounds, had they indulged themselves even in a slight degree in tasteful ornament and embellishment, without impairing at all the convenience, utility, or permanence of their works, might have rendered them extremely beautiful. In so doing they would have found in them a new and prolific source of pleasure, may I not add also of improvement. I know their candor will pardon these suggestions which have no unkind origin; and which have their foundation in the universal beauty of the natural world, as seen every where and always, even in the perishable crystals of the frost, and the fading tints of the sky, in the plumage of the birds, in the unrivalled splendors of the vegetable world; in a word, in every production of the divine power and goodness, from an atom floating in the sunbeam, to a planet wheeling its course in the glittering arches of the skies.

RUTA BAGA.

From the same.

Ruta baga are differently estimated by different individuals. Mr. Merrill of Lee, Valet of Stockbridge, Lawton of Sheffield, Bacon and Chapin of Richmond, Colt, Goodrich and Plunkett of Pittsfield, highly approve of ruta baga; and some of them consider them of equal value with potatoes for swine or cattle. Mr. Werden of Richmond, dislikes them, and says the general experience of farmers there is against them. It is difficult to reconcile these contradictory statements. They are by no means so nutritious as potatoes, especially those kinds of potatoes which are most farinaceous; and they are not comparable to carrots or parsnips or the sugar-beet for feeding stock. But they are a valuable, though an exhausting crop; and are raised at comparatively little expense. The golden yellow turnips with purple tops are the preferable kind. The white kinds, and what are called the French turnips, are an inferior plant.

Mr. Merrill of Lee, applied them to the fatting of cattle with much success. He purchased a yoke of cattle in the fall, in low flesh, at $50, and having fed them through the winter on two bushels of ruta baga each per day, with good hay but with no other provender, he sold them in the spring for $170, at $8 per 100 lbs.

Mr. Ashburner of Stockbridge, whose cultivation of vegetables is no where excelled in neatness and productiveness, is in the habit of transplanting his sugar-beet by merely making a hole with a hoe, and laying them in horizontally, keeping the tops free. He has found planting with a dibble too slow a process; and the plant is not so likely to live, as the fine dirt is not so easily brought up to the small roots of the plant. He has tried the transplanting of wheat by way of experiment, but it was not successful.

I have transplanted ruta baga with great despatch and entire success, simply by ploughing a furrow, then taking the plants from a seed-bed, dipping them in water, separating them and laying them along in the furrow, with the top on the furrow-slice, at a distance of a foot apart, as fast as a man could walk; and soon following with a plough and covering them. It is well to go over the ground with a hoe, to relieve plants that may be too deeply buried, and to cover those which may by accident have been left exposed. They are almost certain to live; and I have thought the work not more than to thin them out, when they are sowed thickly, where they are to stand. There is an additional advantage in this method, that the plants may be forwarded in the nursery, when it is not in your power to prepare the land in season for sowing the crop where they are intended to stand. I am not able to say whether the sugar-beet is as tenacious of life; but the experiments of Mr. Ashburner lead to such a presumption.

THE ALCHYMY OF THE DUST HOLE.

From the London Globe.

The transmutation of earth into the precious metals is carried on with facility in this metropolis; the very dirt of some of the parishes is as eagerly sought for as place and profit. In St. Marylebone, the present contractor has paid £1,890 per annum for the dust! In St. George Hanover square, the contractor gives £1,230 for the privilege of sweeping the streets; St. Martin's parish received last year, from the contractor £250, and he swept the streets into the bargain! St. James' parish paid £100 for sweeping, and received £200 for the breeze, being a balance in favor of the parish of £100. St. Paul's, Covent-Garden, received £150 from the contractor last year, and this year will receive £210. So, by a species of mercantile legerdemain, or modern alchymy, the enormormous sum of £3,780 yearly is received alone for the accumulated dirt of five parishes.

HEADING DOWN PEACH TREES.

From the Genesee Farmer.

The easy culture, and rareness of disease in the peach tree, in western New York, has caused little attention to be bestowed upon it after transplanting. There is, however, good reason for believing that the quality of the fruit may in many instances be greatly improved by heading down the old tops.

It may be observed that in general peach trees after becoming twelve or fifteen years old begin to bear fruit of diminished size and flavor. At the same time, the growth becomes less thrifty. By removing a part of the branches, new and vigorous shoots are immediately shot forth, possessing the same thriftiness of growth, and bearing the same large and fine fruit that are produced from young trees. This is frequently observed to take place spontaneously, where old trees, loaded with fruit, had been broken down by the wind, and young shoots had subsequently shot up.

J. J. T.

For the Farmers' Register.

ESSAY ON VEGETABLE PHYSIOLOGY.

By George D. Armstrong, Prof. of Nat. Philosophy and Chemistry, in Washington College, Va.

Chapter IX.

PRODUCTION AND GROWTH OF BUDS. POINTS OF PRODUCTION. TIME OF PRODUCTION. PROPAGATION OF PLANTS BY MEANS OF BUDS.

Leaf buds, as they protrude from the stem, have the form of little conical projections; and when cut across, seem to be of a uniform texture. In this condition they must be regarded as growing points, consisting of a highly excitable mass of parenchymatous matter, originating in, and immediately connected with the pith; for although they appear to arise from the bark, yet in reality they are connected with the very centre of the stem. In exogens they always arise either from the termination of the pith, or else from the outer end of one of the medullary rays. In endogens their origin has not been traced with the same exactness; but there seems to be no reason to doubt that they arise from the pulpy substance which, in these plants, corresponds to the medullary system of exogens. The formation and growth of a bud is thus described by Lindley: "Before organization commences in the germ, the embryo branch is an insulated vesicle, connected with the parent stem merely by cellular matter. The effect of the organic power is the addition of new matter to this living vesicle, or *punctum saliens*, and the evolution of new parts, till gradually extending in the direction of its axis, it unites with and becomes a part of the parent plant. In the germ thus situated and supplied with nutriment by the cellular tissue surrounding it, the organization of the branch commences as from a centre. The first part which can be distinctly recognized is the pith; surrounding this, we next perceive lines which are the first traces of the spiral vessels of the future branch, running in a direction from the centre of the parent branch to the peak of the germ; indications of the separation of the cellular matter into scales are next perceptible; but the whole bud or germ is still a truly insulated body, and continues so until circumstances favorable to its complete evolution occur, however distant from its formation. No determinate period, therefore, is fixed for the protrusion of the germ into a bud; but at whatever time this may happen, its course is traceable from the medullary sheath surrounding the pith, to the surface on which it appears, by a pale streak of parenchymatous matter, traversing each annual, concentric, ligneous layer. But this parenchymatous track only marks the advancement of the vital speck or germ to the surface of each annual belt of wood; and is altogether useless as far as regards the germ, except in the belt on the surface of which that germ is seated, with the life of which, indeed, its vitality is intimately connected. Destroy this, and the germ becomes extinct; augment its vital energy, and the germ is unfolded into a perfect bud and branch; but leave things as they are, and the germ will advance to the surface of the next year's belt of wood, and so on progressively, until it be ultimately unfolded, or perish with the destruction of the tree. The twig, therefore, which appears on the surface of an old hollow trunk, is still to be regarded as having originated in the first year of the growth of that part of the trunk, however old it may now be; and its progress is traceable through the shell of the wood which still remains free from decay."

"It is a curious fact, worthy of remark, that the germ, if not yet unfolded, will not advance through any belt of wood, not actually belonging to the stem on which it originated, however intimately connected with it that belt may be; and that the specific action necessary for perpetuating the germ, cannot be begun in any one of a succession of concentric belts, when it has not originated in the first of the succession." Where two branches have grown together, a bud originating in one, can never protrude through a layer of the other, no matter how intimately the two may have become united. "When a bud protrudes to form a branch, the perpendicular vessels of the part on which it appears, separate to permit it to pass between them, and afterwards meet again and pursue their original direction; a circumstance which seems to determine that buds, although attached to the parent stem, are truly distinct individuals; the lateral or vivaperous progeny of the stem, or of the branch on which they grow." If it be true, as Loudon remarks in his 'Encyclopœdia of Agriculture,' that in attempting to improve by cultivation, we must imitate nature exactly, or at least, must operate in those ways only of which nature furnishes an example, in the natural growth of a bud we see our authority for artificial budding. In placing the bud of one tree beneath the bark of another, and in such a way that its axis comes in contact with one of the medullary rays of that stem, we are but imitating the example set us, in the natural growth of every bud.

Buds appear at the axils of the leaves only, generally one to each leaf, sometimes however, as in the peach, we may notice several springing from the same point; formed in such positions they are protected by the shade of the leaves from the hot sunshine of August and September, which otherwise might destroy bodies so delicately organized as they are when first formed. If one of these buds be carefully dissected and examined, the rudiments of all the leaves which were to have been developed during the next summer, may be discovered carefully and closely packed together. "Nothing can be more curious than the manner in which these little rudiments of leaves are packed away within the bud, so as to occupy the smallest possible quantity of room; or more remarkable than the exactness with which the particular mode of folding, which may be peculiar to a given species, is observed in every bud of every individual plant of that species. There is no uncertainty in the disposition of these minute parts, no confusion in the arrangement, nor any thing left to chance; but every plait is so evidently ordered by some great and unvarying superintendent power, that the manner in which the young leaves are folded up has been adopted for purposes of systematic arrangement, under the name of vernation or perfoliation."

During the spring and first part of the summer, the young shoots of a tree increase in length rapidly; but about the first or middle of August this increase ceases almost entirely, and the vital energy of the plant is directed, in part to the perfection of its seed, in part to the formation of wood to give solidity and strength to the new stem, and in part to the productions of buds. In order to protect the rudimentary leaves which these buds contain, from the storms of winter, they are always covered with stiff hard scales. For their further protection, and to prevent their being penetrated by snow or rain, these buds are sometimes covered with a sort of resin, as in the balsam; at other times with hairs lying close to their sides, and forming a kind of thatch to shed the rain, as in the hickory. The leaves of a tree always require two seasons to bring them to perfection; the first season they appear in the form of the rudimentary leaves discoverable in the leaf bud, and never until the second year do they complete their developement, and appear as fully formed leaves.

When leaf buds appear at any other part of the stem except the axils of the leaves, they are considered as altogether irregular in their position, and are termed adventitious buds. Such are the buds which often arise from the roots of some plants, as the Lombardy poplar; and those which grow from the roots of most plants, when the stem is cut off close to the ground. With the cause of this occasional appearance of buds on those parts which do not ordinarily produce them, botanists are altogether unacquainted; this, however, seems to be certain, that it is the cellular parts alone which give origin to buds, and further, that the cellular part of any organ, be it root, stem or leaf, may produce buds. "Thus, they are of constant occurrence at the margin of the leaves of the *bryophyllum;* they are generated in abundance by the roots of the *cydonia japonica*, and they have been seen sprouting from the surface of the leaves of the star of Bethlehem."

When by cultivation we have obtained any particular variety of a plant, we can propagate that variety only by means of the buds; as is exemplified in the common operations of grafting and budding. Whenever a plant is propagated by means of a bud, whether that bud be set in the ground, as is sometimes done, or upon the stem of another plant, as is the more common practice, we must look upon the new plant, rather as a continuation of the old one, than as a new plant, properly so called. If we resort to the seed for the purpose of propagation, we will almost always find that the new plant belongs to the species, but not to that variety of the species from which the seed was taken. This fact should be borne in mind in attempting to multiply such plants as have been improved by cultivation.

Chapter X.

ORGANS OF FRUCTIFICATION. FLORAL ENVELOPES. STAMENS AND PISTILS. PROOF OF THE SEXUALITY OF THESE ORGANS. LINNÆUS'' EXPERIMENTS. HYBRID PLANTS.

Having completed our examination of the organs of vegetation, viz., the root, the stem, and the leaves, we will now turn to the organs of fructification, *i. e.* those organs which are more particularly concerned in the production and perfection of the seed or fruit. These organs taken collectively, form what is commonly called the flower. We will assume the flower of the peach *(amygdalus persica)* as our type. If we examine this flower, commencing at its base, or the point at which it is inserted upon the stem, we will find, first, a circle of five scale-like leaves; these are termed sepals, and, taken collectively, form the calyx or flower-cup. Next to these we find a circle of five colored leaves, larger, more perfect in their form, and more delicate in their structure, than those of the first or outer circle; these are termed petals, and taken collectively form the corolla. Immediately within these, we find ten or more small stem-like organs, surrounding the central organ of the flower; these are termed stamens; and the central organ the pistil. Such is the form which the flower presents in most plants, varying only in the number of each particular class of organs. From this, its typical or normal form, we meet with many variations. In the white lily, *(lilium candidum)*, there is no calyx, the corolla being joined immediately upon the stem. In grasses and other allied generæ of plants, we find a calyx, but no corolla. In the flowers of the oak, the Lombardy poplar, &c., we find neither calyx nor corolla, but simply a little scale situated at the base of the stamens and pistils. In the flowers of some other plants we find no traces of either calyx or corolla, nor even a scale. The only organs which seem to be essential to the perfection of the seed, are the stamens and pistils; and hence, all flowers in which these are found, are considered perfect flowers.

It frequently happens that the calyx and corolla run so much into each other that it is impossible to tell where the one ends, or the other begins, as in the flower of the Carolina alspice, (*calycanthus floridus,*) and in that of the white water-lily (*nymphæa odorata.*) For this reason as well as because their office is supposed to be pretty nearly the same, they are generally classed together by the vegetable physiologist, and the common name of floral envelopes is applied to them. When the calyx is distinguishable from the corolla it is commonly known by being smaller, greener, more leaf-like and more permanent than that organ. These characters however, will not always serve to distinguish it; for we find it larger and more richly colored than the corolla, in the ear-drop *(fuchsia magellanica,)* and less permanent in the different species of poppy (*papaver.*) In fact, there seems to be no better way of defining the calyx, than as the outer circle of the floral envelope; and consequently the name is so applied, whatever the color, size, or other characters of that circle may be. If there is but one circle, that one is generally termed the calyx. The corolla, which is often to be known from the calyx, only by its being situated between that organ and the stamens, is nevertheless, generally the most conspicuous part of the plant, because of the gay colors and fragrant odors which reside in it. The tissue of which the corolla consists is uniformly colorless and transparent; the bright colors for which it is so remarkable, being caused by minute drops of colored liquid, lying in its cells.

Respecting the office of the floral envelope, there has been some difference of opinion, in time past; if, indeed, we are to regard those crude fancies to which some naturalists have given utterance, as a sober expression of their opinions. The commonly received opinion at the present day is, that "the office of the floral envelopes is, in part, to act as a protection to the stamens and pistils whilst they are young; guarding them from sudden variations in temperature, by the thin layers of air which they cause to be interposed between those parts and the atmosphere;" and also, "that when green they act like the leaves, they act as elaborators of food, on which the stamens and pistils may be nourished; and when colored, convert the feculæ deposited at their bases into sugar, for the same purpose."

The stamens, in the flower of the peach, consist of two very distinct parts, viz., a slender white stalk, called the filament, and a yellow head, called the anther. When the anther is ripe, it opens and discharges a yellow dust, called the pollen. The pollen, when examined with the microscope, is found to consist of a vast number of little grains, varying from $\frac{1}{30}$ to $\frac{1}{240}$ of a line in diameter. If one of these grains be thrown upon water, it soon swells, bursts, and discharges a turbid fluid somewhat more dense than water. The same effect is produced when it falls upon the moistened extremity of the pistil.

The pistils, in the flower of the peach, consist of three distinct parts, viz., the thickened base, called the ovary, the slender part interposed between that and the rounded knob at the extremity, called the style, and the rounded knob, called the stigma. Of these parts the ovary and stigma are present in all pistils; but the stile is often wanting, and seems to be no more essential than the footstalk to the leaf. On cutting the ovary open we discover within it the embryo seed. I have remarked that the stamens and pistils seem to be essential to the production and perfection of the seed. They are not, however, always present in the same flower. There is a class of plants which have their stamens and pistils situated in separate flowers, but upon the same stem. Of this class the Indian corn (*zea mays*) may be mentioned as an example; the staminate flowers, occupying what is commonly called the tassel, and the pistillate flowers, the young shuck, the silk of the ear, being in fact the pistils of those flowers. There is also another class of plants which have their staminate and pistillate flowers upon separate plants. Of this class the willow (*salix*) and the hemp (*cannabis*) may be mentioned as examples. Where the staminate and pistillate flowers are on the same stem, they are said to be monœcious, or in a single household; where they are on different stalks they are said to be diœcious, or in two households.

The stamens and pistils are now generally believed to perform offices in the production of the perfect seed, similar to those of the different sexes among animals, in the production of their young; hence, they have received the name of sexual organs; the stamens being considered the fertilizing system, and the pistils the fructifying system. The idea of sexuality among vegetables, appears to have been entertained by some of the old Greek and Roman naturalists. Theophrastus distinguished the male and female flowers, in the fir (*abies*) and willow, (*salix*,) and affirms that the fruit of the female palm will not germinate, unless the pollen of the male be shaken over the pistils of the female flower, previous to the ripening of the seed.

The same idea appears to have been entertained and acted upon, by the Arabians, in early times. Dr. Hasselquist in a letter to Linnæus, dated Alexandria, May 18th, 1750, gives a full description of the manner in which the Arabs treated the date-palm in order to make it bear fruit. As this letter is not only curious, but also instructive, inasmuch as it sets the matter in question clearly before the mind of the reader, I will transcribe it in full.

"The first thing I did after my arrival was to see the date-tree, the ornament and a great part of the riches of this country. It had already blossomed; but I had nevertheless, the pleasure of seeing how the Arabs assist its fecundation, and thus secure to themselves a plentiful harvest of a vegetable, which was so important to them, and known to them many centuries before any botanist dreamed of the difference of sexes in vegetables. The gardener informed me of this before I had time to inquire; and would show me, as a very curious thing, the male and female of the date or palm tree; nor could he conceive how I, a Frank lately arrived, could know it before; for says he, all who have yet come from Europe to see this country, have regarded this relation either as a fable or miracle. The Arab seeing me inclined to be further informed, accompanied me and my French interpreter to a palm-tree, which was very full of young fruit, and had by him been wedded or fecundated with the male, when both were in blossom. This the Arabs do in the following manner: When the spadix has female flowers that come out of its spatha, they search out a tree that has male flowers, (which they know by experience,) the spadix of which has not yet bursted out of its spatha; this they open, take out the spadix, and cut it lengthwise in several pieces, but take care not to hurt the flowers. A piece of this spadix with male flowers they put lengthwise between the small branches of the spadix which has female flowers, and then lay a leaf of the palm over the branches. In this situation I yet saw the greatest part of the spadices which bore their young fruit; but the male flowers which were put between were withered. The Arab besides gave me the following anecdotes: First, unless they in this manner wed, and fecundate the date-tree, it bears no fruit. Secondly, they always take the precaution to preserve some unopened spathæ with male flowers, from one year to another, to be applied for this purpose, in case the male flowers should miscarry, or suffer damage. Thirdly, if they permit the spadix of the male flowers to burst or come out, it becomes useless for the purpose of fecundation. Therefore, the person who cultivates date-trees must be careful to hit the right time for assisting their fecundation, which is almost the only article in their culture. Fourthly, on opening the spatha he finds all the male flowers full of a liquid, which resembles the finest dew; it is of a sweet and pleasant taste, resembling much the taste of fresh dates, but much more refined and aromatic; this was likewise confirmed by my interpreter, who had lived thirty-two years in Egypt, and therefore, had opportunities enough of tasting both the nectar of the blossoms and the fresh dates."

This letter was written at a time when the sexuality of the organs of plants was a matter of controversy among botanists. Since then it has been settled by experiments of the most satisfactory nature, which have been often repeated. Among these experiments there are none which are more satisfactory, or afford a better example of what experiments on such a subject should be, than those of Linnæus; and for these reasons I shall give them in full, from Smith's translation of 'Linnæus' Dissertation on the sexes of plants,' published as early as 1769.

"In the month of January 1760, the *antholyza cunonia* flowered in a pot in my parlor, but produced no fruit, the air of the room not being sufficiently agitated to waft the pollen to the stigma. One day about noon, seeing the stigma very moist, I plucked off one of the antheræ, by means of a small pair of forceps, and gently rubbed it on one of the expanded stigmata. The spike of flowers remained eight or ten days longer; when I observed, on gathering the branch for my herbarium, that the fruit of that flower only on which the experiment had been made had swelled to the size of a bean. I then dissected this fruit, and discovered that one of the three cells contained seeds in considerable numbers, the other two being entirely withered.

"In the month of April I sowed the seed of hemp (*cannabis*) in two different pots. The young plants came up so plentifully that each pot contained 30 or 40. I placed each by the light of a window, but in different and remote apartments. The hemp grew extremely well in both pots. In one of them, I permitted the male and female plants to remain together, to flower and bear fruit, which ripened in July; and being macerated in water, and committed to the earth, sprung up in twelve days. From the other, however, I removed all the male plants as soon as they were old enough for me to distinguish them from the females. The remaining females grew very well, and presented their long pistilla in great abundance, these flowers continuing a very long time, as if in expectation of their mates; while the plants in the other pot had already ripened their fruit, their pistilla having, quite in a different manner, faded as soon as the males had discharged all their pollen. It was certainly a beautiful and truly admirable spectacle, to see the unimpregnated females preserve their pistilla so long green and flourishing, not permitting them to begin to fade till they had been for a considerable time exposed in vain, to the male pollen. Afterwards, when these virgin plants began to decay through age, I examined all their calyces in the presence of several botanists, and found them large and flourishing, although every one of the seed-buds was brown, compressed, membranaceous, and dry; not exhibiting any appearance of cotyledon or pulp. Hence I am perfectly convinced, that the circumstance which authors have recorded, of the female hemp having produced seeds although deprived of the male, could only have happened by means of pollen brought by the wind from some distant place. No experiment can be more easily performed than the above; none more satisfactory in demonstrating the sexuality of plants.

"The *clutia tenella* was in like manner kept growing in my window, through the months of June and July. The male plant was in one pot, and the female in another. The latter abounded in fruit, not one of its flowers proving abortive. I removed the two pots into different windows of the same apartment; still all the female flowers continued to become fruitful. At length I took away the male entirely, leaving the female alone, and cutting off all the flowers which it had already borne. Every day new ones appeared from the axils of the leaves; each remaining eight or ten days; after which, their foot-stalks turning yellow, they fell barren to the ground. A botanical friend, who had amused himself with observing this phenomenon with me, persuaded me to bring from the stove" (or hot-house, as it is more commonly termed in this country) "in the garden, a single male flower, which he placed over one of the female ones, then in perfection, tying a piece of red silk round its pistillum, to mark it. The next day, the male flower was taken away, and this single seed-bud remained, and bore fruit. Afterwards, I took another male flower out of the same stove, and with a pair of slender forceps pinched off one of its anthers, which I afterwards gently scratched with a feather, so that a very small portion of its pollen was discharged upon one of the three stigmata of a female flower, the two other stigmata being covered with paper. This fruit likewise attained its due size; and on being cut transversely, exhibited one cell filled with large seed, and the other two empty. The rest of the flowers, being unimpregnated, faded and fell off. This experiment may be performed with as little trouble as the former.

"The *datisca cannabina* (or false hemp) came up in my garden from seed, ten years ago, and has every year been plentifully increased by means of its perennial roots. Flowers in great numbers have been produced by it; but being all females, they proved abortive. Being desirous of obtaining male plants, I procured more seed from Paris. Some more plants were raised; but these likewise, to my great mortification, all proved females, and bore flowers, but no fruit. In the year 1757, I received another parcel of seed. From these I obtained a few male plants, which flowered in 1758. These were planted at a great distance from the females; and when their flowers were just ready to emit their pollen, holding a paper under them, I gently shook the spike, or panicle, with my finger, till the paper was almost covered with the yellow powder. I carried this to the females, which were flowering in another part of the garden, and placed it over them. A cold night soon after destroyed these datiscus, with many other plants much earlier than usual. Nevertheless, when I examined the flowers of those plants which I had sprinkled with the fertilizing powder, I found the seeds of their due magnitude, whilst in more remote datiscus, which had not been impregnated with pollen, no traces of seeds were visible.

"Several species of *momordica* cultivated with us, like other Indian vegetables, in close stoves, have frequently borne female flowers; which, although at first very vigorous, after a short time have constantly faded, and turned yellow, without perfecting any seed, till I instructed the gardener as soon as he observed a female flower, to gather a male one, and place it above the female. By this contrivance we are so certain of obtaining fruit, that we dare pledge ourselves to make any female flower fertile that shall be fixed upon.

"The *jatropha urens* has flowered every year in my hot-house; but the female flowers coming before the males, in a week's time dropped their petals, and faded before the latter were opened; from this cause no fruit had been produced, but the germina themselves had fallen off. We have therefore never had any fruit of the *jatropha* till the year 1752, when the male flowers were in full vigor on a tall tree at the same time the females began to appear on a small *jatropha* which was growing in a garden pot. I placed this pot under the other tree, by which means the female flowers bore seed, which grew on being sown. I have frequently since, amused myself with taking the male flowers from one plant, and scattering them over the female flowers of another, and have always found the seed of the latter impregnated in this way.

"Two years ago, I placed a piece of paper under some of these male flowers, and afterwards folded up the pollen which had fallen upon it, preserving it so folded up, if I remember aright, four or six weeks, at the end of which time another branch of the same *jatropha* was in blossom. I then took the pollen which I had so long preserved in paper, and strewed it over three female flowers, the only ones at that time expanded. These three females proved fruitful, while all the rest which grew in the same bunch fell off abortive.

"The interior petals of the *ornithogalum canadense*," (commonly called Star of Bethlehem) "cohere so closely together, that they only just admit the air to the germen, and will scarcely permit the pollen of another flower to pass; this flower produced every day new flowers and fruit, the fructification never failing, in any instance; I therefore, with the utmost care, extracted the anthers from one of these flowers with a hooked needle; and as I expected, this single flower proved barren. This experiment was repeated about a week afterwards, with the same effect.

"I removed all the anthers out of a flower of the scarlet-horned poppy, (*chelidonium corniculatum*,) which was growing in a remote part of the garden, upon the first opening of its petals, and stripped off all the rest of the flowers; another day I treated another flower of the same plant in a similar manner, but sprinkled the pistil of this with the pollen borrowed from another plant of the same species; the result was, that whilst the first flower produced no fruit, the second afforded very perfect seed. My design in this experiment was to prove, that the mere removal of the anthers from a flower, is not of itself sufficient to render the germ abortive.

"Having the *nicotiana fruticosa* growing in a garden pot and producing plenty of flowers and seed, I extracted the anthers from a newly expanded flower before they had burst, at the same time cutting away all the other flowers; this germ produced no fruit, nor did it even swell.

"I removed an urn, in which the *asphodelus fistulosus* was growing, to one corner of the garden, and from one of the flowers, which had lately opened, I extracted its anthers; this caused the impregnation to fail. Another day I treated another flower in the same manner; but bringing a flower from a plant in a different part of the garden, with which I sprinkled the pistil of the mutilated one, its germen became by this means fruitful.

"*Ixia chinensis*, flowering in my stove, the windows of which were all shut, all its flowers proved abortive. I therefore, took some of its anthers in a pair of pincers, and with them sprinkled the pistils of two flowers, and the next day one stigma only of a third flower; the seed-buds of these flowers remained, grew to a large size, and bore seed; the fruit of the third however, contained perfect seed in only one of its three cells. To relate more experiments would only be to fatigue the reader unnecessarily. Every flower bears witness to the truth of the doctrine I have endeavoured to inculcate."

Adopting as true the doctrine of the sexuality of the stamens and pistils of plants, and of the production of the seed by their joint action—a doctrine which Linnæus has established by experiments as ingenious and satisfactory as those just detailed—we may notice in the habits of plants, and also in their structure and the position of their several parts, a remarkable adaptation to this end. In perfect flowers, the stamens or fertilizing organs are always situated immediately around the pistils, or fructifying organs; and are generally of such a length as is most suitable for scattering the pollen on the stigma. In flowers which naturally stand in an erect position, the stamens are then longer, or at least of the same length as the pistils; whilst in nodding flowers, as in those of spotted lily, (*lilium canadense*,) the stamens are shorter than the pistils. As the pollen naturally descends by its own gravity, the relative length of these organs is evidently that which is best fitted for throwing it upon the pistil. The anthers, or pollen cases, are possessed of a very considerable elastic spring, which, when they burst, serves to throw the pollen upon the stigma. Sometimes, in erect flowers, we find the stamens much shorter than the pistil. In such cases, we will generally notice some especial contrivance for throwing the pollen upon the pistil. A very curious contrivance of this kind is presented in the flowers of the laurel, or ivy as it is commonly called, (*ralmia*.) In the sides of the cup-shaped corolla of that flower, there are a number of folds, which surround the anther in the unexpanded state of the flower, and retain it for some time after the corolla has opened. In this position the filament is necessarily bent, with its convex side turned outwards, and thus is it retained until the action of the sun has sufficiently increased its elasticity to enable it to break loose, and snap its pollen upon the stigma. The stigma itself is covered with a gummy liquid, which enables it to retain the pollen cast upon it.

Where the stamens and pistils are in different flowers upon the same plant, the staminate flowers are generally situated higher upon the stem, than the pistillate, as in the Indian corn (*zea mays*) in which (as has been already remarked) the staminate flowers form the tassel, and the pistillate ones the young ear. Where this is not the case, and also in diœceous plants, the pollen is generally conveyed by the wind, or by insects, from one flower to the other. The pollen of the pines, moved by winds, may often be seen, rising like a cloud above the forests; the particles thus disseminated, fall upon the pistillate flowers, and fertilize the germ. A curious fact is stated by an Italian writer, viz: that in places about 40 miles distant, grew two palm trees, the one bearing staminate flowers, the other pistillate ones, and that neither of them bore fruit for many years; but in process of time they grew so tall as to tower above all the objects near them. The wind thus meeting with no obstruction, wafted the pollent to the pistillate flowers, which to the astonishment of all, began to produce fruit. In such monœceous vines as the cucumber (*cucumis sativus*,) the pollen is conveyed from flower to flower by insects, especially honey-bees. The object of the bee is in the discovery of honey; and whilst searching for it, it unintentionally covers its body with pollen, which it conveys to the next flower it visits, and brushes off as it acquired it, by rummaging for honey; so that a part is almost unavoidably deposited upon the stigma, and fecundation is thus effected. "Nor is this altogether so much a work of random, as it at first appears; for it has been observed that even insects, which do not upon the whole confine themselves to one species of flower, will yet very often remain during the whole day upon the species they happened first to alight upon in the morning." The The agency of insects in transferring the pollen from one flower to another, should be borne in mind, in cultivating such plants as the cucumber. Where they are raised in a hot-house or in any other position, where insects have not free access to them, the staminate flowers should always be taken off, and shaken over the pistillate ones.

Many aquatic plants, which vegetate for the most part wholly immersed in water, and often at a considerable depth, gradually begin to elevate their stems as the season of flowering advances. At length, they rear their heads above the surface of the water, open their flowers, and so continue until fecundation is effected; after which they again sink down to the bottom, to ripen and sow their seed. The most remarkable example of this kind, is that of the *valisneria spiralis*, a plant which grows in the ponds and ditches of Italy. Loudon gives the following description of this curious plant. "The plant is af the class *diœcia*, producing its fertile or pistillate flowers upon the extremity of a long and slender stalk twisted spirally like a cork-screw; which, uncoiling of its own accord about the time of the opening of the blossom, elevates the flowers to the surface of the water, and leaves them to expand in the open air. The staminate flowers are produced in great abundance, upon short upright stalks, issuing from a different root, from which they detach themselves about the time of the expansion of the pistillate blossoms, mounting up like air-bubbles, and suddenly expanding when they reach the surface, where they float about in great numbers among the pistillate flowers, and often cling to them in clusters, so as to cover them entirely; thus bringing the stamens and pistils in immediate contact, and giving the anthers an opportunity of discharging their pollen immediately over the stigma. When this operation has been performed, the now uncoiled stalk of the pistillate plant begins again to assume its original spiral form, and gradually sinks down, as it gradually rose, to ripen its fruit at the bottom of the water. In 1819, I gathered these stalks, in the canals near Padua, upwards of ten feet long."

A knowledge of the true nature of the stamens and pistils, and also of the parts which they act, in the production and perfection of the seed, will enable us to explain a curious fact, which every farmer must have observed, viz: the crossing of different varieties of a plant when growing near each other. When white corn is planted by the side of yellow corn, the ear produced will be of a character intermediate between the two. This effect is more remarkable in the case of white-corn and the small blue species, termed chicken corn, when raised side by side. The ear produced in such a situation, will very often have the size of the first, and the color of the second species. This effect arises entirely, from the falling of the pollen of the first upon the pistils of the second. Such an effect as this, we would naturally expect to occur most frequently in the case of those plants which have their stamens and pistils in different flowers; and such is the fact, as determined by observation. Hence the necessity of planting the different varieties of such plants at some distance from each other, if we wish to keep those varieties separate.

This effect however, is not confined to such plants, nor is it necessarily the result of accident. It can be produced in any plant, by artificially fecundating the pistil of one variety with the pollen of another. The following experiment of Mr. Knight may be mentioned in proof this statement. "In 1787, a degenerate sort of pea was growing in my garden, which had not recovered its former vigor, even when removed to a better soil. Being thus a good subject of experiment, the stamens of a dozen of its flowers were destroyed, whilst the pistils were left uninjured. When the blossoms had attained their mature size, the pollen of a very large and luxuriant gray pea was introduced into one-half of them, but not in the other. The pods of both grew equally, but the seeds of the half which were unimpregnated, withered away without having augmented beyond the size to which they had attained before the blossom expanded. The seeds of the other half were augmented and matured as in ordinary cases; and exhibited no difference from those of other plants of the same variety; perhaps because the external coat of the seed was furnished by the pistillate plant. But when they were made to vegetate in the succeeding spring, the effect of the experiment was obvious. The plants rose with great luxuriance, indicating in their stem, leaves, and fruit, the influence of this artificial impregnation; the seeds produced, were of a dark gray-color. By impregnating the flowers of this variety with the pollen of others, the color was again changed, and new varieties obtained, superior in every respect to the original, on which the experiment was first made, and attaining, in some cases, to a height of more than twelve feet."

These are cases of hybrid plants, produced from different species of the same genus; whether hybrids can be produced from species belonging to different genera, is a matter about which botanists are not agreed. The more common opinion at present is, that they can, in the case of different genera belonging to the same natural order; and the experiments of Herbert, Sweet, and others, serve to confirm this opinion. Sweet states that he has produced many new geraniums in this way. Mr. Knight states, that all his attempts to obtain them, proved unsuccessful. Linnæus was of the opinion that they could be produced, and he even went farther, and asserted that they were produced in the ordinary course of nature. In a dissertation, entitled '*Plantæ Hybridæ*,' he gives a list of 47 such plants, together with the plants from which he supposes then to have been produced. For example, he considers the *delphinium hybridum* (a peculiar species of larkspur) a hybrid, produced from the *aconitum naphellum* (wolf's-bane,) and the *delphinium elatum*, (another species of larkspur.) From the examples given in this dissertation, Linnæus draws this conclusion: "That only two species of each genus existed *ab origine;* and that all the variety of species which now appears, has been produced by the unnatural scattering of the pollen of one species, upon the pistil of another species belonging to a different genus." In this conclusion, he evidently goes farther than the facts of the case will justify him.

Chapter XI.

COLOR. CHANGES IN COLOR. XANTHIC AND CYANIC SERIES. ODORS; PERMANENT AND FUGITIVE. FLOWERING.

There is no subject connected with the physiology of plants of which so little is certainly known, as the causes of the various and ever-varying colors with which flowers are adorned. "We see flowers, marked with the strongest contrast of the most dissimilar colors, reproduced with an exactness, which is most wonderful. We know that in some plants, without accident, without any visible constitutional change, or any known predisposing cause, a yellow flower will become pink, and a pink one yellow; and we know that if the portion of the stem whose flowers have been thus altered, be multiplied by the division of itself, the change is fixed, and may be continued for ever. A dingy brownish purple tulip will suddenly, and without warning, burst forth in the most radiant beauty, its dull disagreeable color disperse, a pure and spotless white taking its place, in part, and the brightest and deepest streaks of crimson adding richness to its purity. If we look minutely to these circumstances, we shall find that each particular cell has its own color; that there is no intermixture of tints, but that whatever the hues may be, each has its own cluster of cells to represent it; and even in the midst of a large mass of uniform coloring, a few cells, or even a single one, will secrete a coloring matter which forms the strongest contrast with what surrounds it, as in the spotted lily, and similar cases." Respecting the cause to which all these extraordinary circumstances are to be ascribed, little is known. Still, observation and experiment have put us in possession of some facts respecting this subject, and our knowledge of nature has enabled botanists to form some conjectures, which to say the least, are not improbable. As this is a subject of some importance to the cultivator of flowers, as well as of considerable interest to every one who attempts to gain an insight into the physiology of vegetables, I shall attempt to give an abstract of what is known respecting it; contenting myself with, simply abridging the account which Prof. Lindley has extracted from the writings of De Candolle; which I would remark, is the only attempt at a full and consistent account of the matter, which I have seen.

We are so accustomed, he remarks, to see plants decorated with the most brilliant colors, or at least invested with the green hue, which characterizes every scene, that it is not without difficulty we admit the idea, that such colors do not exist in the plant in its primitive state, but are communicated to it by its own act; and yet such is the truth. The tissue of plants is, in itself, completely colorless, of a silvery white, or of an exceedingly pale yellow; and the matter contained in the cellules is, with few exceptions, of the same color; but all is changed when they are once exposed to solar light. We are accustomed to say that green plants become white in total darkness. Such, however, is not the fact. Leaves which, in ordinary circumstances, would have been green, if made to grow from the very first in perfect darkness, will be white or colorless; yet leaves which have been once colored never lose their color by being kept away from the light; if they sometimes appear to do so, it is owing to this: that *if* the half developed leaves are excluded from the light, they grow larger, whilst no more coloring matter is formed, and of course, that which originally existed in the leaf is diluted and spread over a larger space, and thus the color of the leaf is made paler without any of the coloring matter having been destroyed.

The presence of solar light appears, in ordinary circumstances, to be necessary to the full developement of the coloring matter of plants; and hence it is, that if a leaf be half covered, and half exposed to its action, one part remains colorless, whilst the other becomes green. This is seen in the case of leaves of grass growing out from under a log of wood or any other similar body. The intensity of the color is generally proportioned to the intensity of the light to which a plant is exposed, and also to the time for which it has been exposed to that light. The number of white flowers indigenous to northern regions, is much greater than in equatorial countries. Many flowers, which in the bud, or when but partially expanded, are white, afterwards become deeply colored. The variable wall-flower (*cheiranthos chamelis*) has a flower, at first of a white color, which afterwards becomes lemon-yellow, and lastly a decided red. Their color seems also, to depend in part, upon the temperature to which plants are exposed. The *hibiscus mutabilis*, a plant of the West Indies, has its flowers white in the morning, pink at noon, and at night red. On the 19th of October, 1828, the flowers of this plant were noticed to remain white all day in the gardens at Havanna, and not to become pink until noon the next day. This 19th of October was remarkable for the thermometer not rising higher than 67° Fahr., whilst the ordinary temperature of the flowering season of the *hibiscus* is 85° to 90° Fahr. It was stated that, in ordinary circumstances, the action of solar light seemed necessary to the full developement of vegetable colors; in certain extraordinary circumstances, as for instance, in an atmosphere containing a large portion of hydrogen, or at great depths in the sea, light does not seem to act so important a part. Humboldt found several plants in the subterranean galleries of the mines of Freyberg, which were green, although they must have grown from the first in total darkness. The atmosphere of those mines contained, according to his observations, a very large proportion of hydrogen. At another time, he found near the Canaries, a fucus which was bright grass-green, although it had grown at a depth of 180 feet from the surface of the water. The light by which this fucus was illuminated whilst growing, according to the laws which are known to govern light when traversing water, must have been 200 times less than that of a candle at a foot distance.

The effect of solar light upon plants, is to fix carbon in their tissues. Hence it is natural to conclude, that this operation is connected with the production of color. In fact, when it takes place, coloring ensues; when it does not take place, the organs preserve the primitive white color of their tissues; and when it has taken effect incompletely, the results are of an intermediate character. The deposition of carbon thus effected, does not operate upon the vegetable membrane; that always retains its original pearly lustre. But by effecting a combination with hydrogen and oxygen it forms a peculiar substance, termed a chromule, the abundance or scantiness of which determines the tint of the leafy surface. The tissue, no doubt, produces some effect, by reason of its own pallid hue, or its density, or the hairs with which it is covered, or the air which it contains. How it is that the union of these elements produces such a variety of colors; or how it is that carbon, which is black, united to oxygen and hydrogen, which are colorless, can give rise to any other color than black, we can no more explain, than we can, how it is that copper, which is reddish-brown, and nitric acid, which is colorless, form the beautiful blue salt which they do. We only know these things as facts; and until we better understand the nature of chemical union, we cannot expect to know any thing more about them. Some of the older physiologists attempted to account for the green color of leaves, by supposing that the color of charcoal was not black, but a very intense blue; and that shining through the yellow sides of the cells, the combination of the two colors produced green. This notion, however, is disproved by the most superficial examination; for the coloring matter may be separated from the tissues with the greatest facility, and it still preserves its color; and besides, the yellow of the tissues, if any, is so exceedingly feeble, as to be wholly unable to cause the blue of the carbon to appear green, if the carbon were indeed blue.

Leaves which are usually green, assume different colors, when about to decay. It is common to see, in the autumn, this green change into yellow, as in the Lombardy poplar; or red as in the sumach, and some kinds of oak. It has been ascertained, that in such cases, shortly before the change takes place, the leaves cease to exhale oxygen in sun-light, but do not cease to absorb it at night; hence it is inferred, that the chromule is oxydized, which at first brings on a yellow, and afterwards a red color; for the most decided red, always begins by a change to yellow. It has also been remarked, that red colors are most common in leaves which contain some kind of acid, as in the vine, the sorrel, &c. The red coloring matter obtained from such leaves forms an infusion, which, like that obtained from red flowers, becomes more intense, when acted upon by an acid. The infusion of yellow leaves is affected by the action of alkalies, in a manner precisely like that of yellow flowers; *i. e.* is changed to a reddish brown. Hence some have supposed, that whilst red is owing to the developement of an acid, others colors may be ascribed to the presence of an alkali.

The puncture of an insect, the attack of a parasitical fungus, or an early frost, may prodnce a change in the color of a leaf, or part of a leaf; and what is worthy of remark, the colors thus accidentally produced, are the same which the plant would have taken of itself in the autumn. Thus accidents turn the leaves of the poplar and lilac yellow, of the sumach and pear tree, red. This would seem to indicate that the colors are produced in accordance with some fixed law, and by a change in some element which exists at all times in the plant. In many plants, the leaves which grow in the vicinity of the flower, frequently present various tints, and these tints are almost always in unison with the flowers which they accompany; thus in the euphorbias, they are white, in the *amaranthus melancholicus* (love-lies-bleeding) they are red.

With respect to the relation which colors bear to each other, they have been divided into two series. Those of one series, have yellow for their typical color, and are capable of passing into red or white, but never into blue; those of the other, have blue for their typical color, and are capable of passing into red or white, but never yellow. Green is considered to arise from an equilibrium of the two. De Candolle calls the first series *xanthic*, from the Greek word meaning yellow, and the other *cyanic*, from the Greek word meaning blue. Upon this principle he has constructed the following scale.

Red,	*Xanthic series.*
Orange-red,	
Orange,	
Orange-yellow,	
Yellow,	
Yellow-green,	
Green,	*Equilibrium.*
Greenish-blue,	*Cyanic series.*
Blue,	
Violet-blue,	
Violet,	
Violet-red,	
Red,	

It will be at once remarked, in considering this table, that all the flowers capable of changing their colors, do it, by rising or descending in the series to which they belong. Thus the flowers of the rose, which belong to the xanthic series, in one species is yellow, in another red, and in another white, but never blue. The *anemone*, which belongs to the cyanic series, varies from white on the one hand, to violet-red and red on the other, but never yellow. Although there are certain exceptions to this rule, particularly in the hyacinths, some of whose varieties approach the xanthic series, although the plant properly belongs to the cyanic, yet it is so far conformable to nature, as to help us, to predict the changes in color which the flowers of any plant may undergo.

White is nor mentioned in either series, because it is doubted whether it exists in a state of purity in any flower; it seems, rather to be some other color, reduced to an exceedingly light tint. Redouté, a celebrated French flower painter, is said to have availed himself, with great advantage, of this fact. He always placed the flower he wished to paint, upon a sheet of paper, like that on which he made his drawing; and he invariably found, that the flower would differ from the paper, in being more yellow, or more blue, or in some other way. Infusions of white flowers in alcohol, have always a perceptible tinge. Many flowers apparently white, yield an infusion, which the action of an alkali brings to a decided yellow; many others yield infusions, which the action of an acid brings to a decided red, thus indicating, in the first case, the presence of the xanthic chromule; in the second, the presence of the cyanic chromule. Black is omitted in the two series of colors, because it appears, in all cases, to be an excessively dark shade of purple or brown. When the circumstances are unfavorable to the color, black flowers (as they are called) always appear of some lighter shade. The flowers of the false-choke-dog (*gonolobus obliquus*) which are as nearly black as any growing in this country, appear light-purple, when they are produced during a long rainy season.

Respecting the manner in which the odoriferous principles of plants are produced, still less is known than about their colors. We are gratified by the sweet odors exhaled from the leaves and flowers which surround us, and exert our skill so to preserve them, that we may have them always at command; but as to the reason why one plant is odoriferous and another is not, or why one plant gives rise to one kind of odor, and another to another, we have to confess ourselves entirely ignorant. Still there are some facts respecting odors, which have been learned by observation, which it may be worth the while to mention. All odors are owing to the disengagement of volatile matter; and as there are few organized bodies in which, in their natural state, there is not some volatile constituent part, so neither are there many absolutely destitute of smell. But it is only those plants, and parts of plants, whose scent is very perceptible to our senses, that we term odoriferous, and to these we will confine our attention.

Odors are divided by botanists into two classes, viz: permanent and fugitive. When the volatile matter is concentrated, and so enclosed in the the cells, as to disperse closely, it gives rise to a permanent odor. Of this many instances are afforded by the wood and bark of trees. The wood and bark, being the only permanent parts of vegetables, will of necessity, be the only receptacles of permanent odors. Such parts are not scented, because of their own proper nature, for all the tissues of plants are, in themselves, destitute of odor, or nearly so. The odors arise entirely, from the fragrant secretions imprisoned in their cavities; and their permanence depends upon the difficulty, which these secretions experience, in escaping through the tissue which encloses them, and also upon the degree in which the secretions are in themselves volatile. Resinous woods, such as the cedar and pine, retain their fragrance for an indefinite period; because the resinous matter in which their odors reside is not in itself very volatile, and is moreover imprisoned in thick stout cells. The rose-wood of Teneriffe preserves its odor for a great length of time; and in order to elicit it, it is necessary to rub the wood strongly, so as to break the cells, and also, to produce heat enough to volatilize the matter enclosed in them. The necessity of a certain degree of heat, to produce an exhalation of the volatile matter of some plants, is farther exemplified in the fragrance of many kinds of wood, otherwise scentless, when exposed to the violent friction of a turner's lathe. Beech, in such circumstances, gives out an odor similar to that of roses. Where the odoriferous matter is rather volatile, and enclosed in cells of a loose texture, woods soon lose their peculiar odors, as is the case with the bark of the cinnamon.

Fugitive odors, are such as belong to perishable organs, or are placed in tissues of the very loosest texture, or are situated on the surface of plants, or are secreted in quantities so small, that a short exposure to the atmosphere is sufficient to dissipate them. Such odors are produced only during the life of the plant, are dissipated almost as soon as formed, and, after the death of the plant, leave no trace of their existence behind. Like permanent odors, they are continually given off; and in some plants, as the violet, without any variation in intensity, in different states of the atmosphere. But in most cases, the intensity of the odor will vary, according to the elevation of the temperature, and the dampness of the air. This fact must be familiar to all acquainted with flowers. In a hot summer's noon, flowers become scentless, or at least, lose a large portion of their usual fragrance; so that in walking amongst the most sweet-smelling plants, we discover no signs of their odor, unless we bruise or trample upon them. But let a heavy shower come on, and all will be changed in an hour's time; every leaf, every flower, will emit its peculiar odor. The same thing may be noticed during the dry days towards the close of summer. "Those only who are accustomed to take their walks early, can have any idea of the difference between a richly stored garden, or flowery-meadow, early in the morning, and at noon. When the sun has dried the air, and been beating for some time upon vegetation, however beautiful the garden or the meadow may still remain, it cannot be compared with the same place before the dew had dispersed; when every herb, tree, and flower is pouring forth a stream of of the most varied and delicious fragrance, when the air is loaded with the most delicate odors—and when all nature seems as if offering up incense in gratitude for the descent of the refreshing dew." To what cause this difference is owing is not well ascertained. Possibly the effect of dryness, and excessive heat, may be to close the stomas or breathing pores, and to contract the tissues of the plant, thus rendering it difficult for volatile matter to pass through the cuticle; it may also act, by depriving them of the portion of water necessary to enable them to perform their functions, and thus arrest for a time, the production of the odoriferous principle on which their fragrance depends. While, however, dew and showers, with intervals of bright sunshine, are eminently calculated to elicit the perfumes of vegetables, a continuance of wet and gloomy weather, is very unfavorable to them. Sun-light appears to be necessary for the production of the odors of flowers, as well as their colors.

Agreeable as vegetable odors usually are, there are some remarkable exceptions. Many stapelias, and the *arum dracunculus*, have an odor so completely like that of putrid meat, that flies actually deposite their eggs in them by mistake. The leaves of the fish geranium *(pelargonium zonale)* when rubbed between the fingers, give out an odor very much resembling that of salted-fish, and hence its common name. Even the most agreeable kinds of fragrance, when much concentrated, generally become disagreeable. The odoriferous matter exhaled by flowers, frequently produces very unpleasant effects upon persons of weak nerves. Violets, the last flower to be suspected, have in some instances, proved deleterious. De Candolle states, that he has known ladies to faint, from carrying too many of them on their persons, or from having them placed too near them when asleep. The elder and the walnut when in bloom, often bring on head-ache, in persons who sleep in their shade; and the manchineel tree, of tropical countries, is said to have proved fatal to travellers who have thoughtlessly lain down to rest beneath its shade.

The act of producing blossoms, is called flowering. Respecting the flowering of plants, some facts have been collected which are worthy of notice. Flowers are always produced in the centre of the bud, and are embosomed among the leaves for a considerable time before they expand. In general they are formed so rapidly, that a few months are sufficient to perfect them; but in certain palms several years are required. It is said, that in these plants the rudiments of flowers may be discovered in the central bud, in some instances as much as seven years before the perfect flower expands. Plants differ much from each other in the season at which they produce their flowers, yet the season for each particular species, is generally fixed and invariable. Annuals flower a few weeks after their seed are sown, biennials require two seasons, perennials more than two, and trees several years. Some again, blossom in the winter, as the Christmas rose; others in the earliest spring, as the snow-drop and crocus; whilst others cannot by any known means be made to blossom, until late in autumn. The same is true of the hours at which they open their blossoms. One expands at dawn of day, another a few hours later, another at mid-day, others early in the evening, and a few only at night. By noting the time at which different plants open their blossoms, what are termed "watches of Flora," have been constructed. The following notice of the time at which several flowers open their blossoms, is taken from such a watch, constructed by De Candolle, for the latitude of Paris.

Convolvulus nil (common morning glory) - - - - -	3 to 4 A. M.
Papaver nudicaule (naked-stemmed poppy) - - - -	4 to 5 "
Convolvulus tricolor (three colored morning glory) - -	5 to 6 "
Solanum (nightshade, or nettle)	6 to 7 "
Hieracium (hawk-weed)	
Lactuca sativa (garden lettuce)	7 to 8 A. M.
Anagallis arvensis (field chickweed) - - - - -	8 to 9 "
Arenaria (sand-wort) - -	9 to 10 "
Portulacca sativa (purslane) -	10 to 11 "
Mirabilis jalapa (yellow four o'clock) - - - - -	6 to 7 P. M.
Pelargonium triste (mourning geranium) - - - - -	7 to 8 "
Anothera suaveola (night flowering primrose) - - - -	8 to 9 "

(To be continued.)

CULTURE OF SILK IN ITALY.

From Young's Notes on the Agriculture of Lombardy.

Nice.—Eight *roups* of cocoons, or 84 lb. make 24 lb. of silk (11½ oz.), which sells at 10 *liv.* 5*s.* the lb,; a *roup* of leaves sells at 20*s.* and 250 *roup* are necessary for 8 oz. of grain (eggs).

Coni.—The whole country, after ascending the Alps, is planted with mulberries, around every field, and if large, in lines across. I remarked great numbers from ten to fifteen years old.

To Chentale, 1 oz. of grain requires 360 *roup* of leaves; each *roup* 25 lb. and yields 4 or 5 *roups* of *bozzoli* or *cacata* (cocoons), and 1 *roup* of cocoons makes 3 lb. of silk. The price of organzine 20 *liv.* to 24 *liv.* per lb.; the offal pays the spinning. Gathering the leaves costs 2*s.* to 3*s.* the *roup.*

Chentale.—The seed of the mulberry is sown in nurseries, and the trees commonly planted out at four years old. The first, second and third year, they are pruned, for giving the branches the right form; the fourth, they begin to gather the leaves. Some which were shown me by the Count de Bonaventa, of eighteen years old, give 6, 7, and to 8 *rubbii* of leaves each. One old tree, a very extraordinary one, has given 63 *roups.* A large tree, of fifty or sixty years, commonly yields 25 *rubbii.* They never dig around them, nor wash the stems as in Dauphiné; but they have a practice, not of equal merit, which is to twist straw-bands around the stems, to defend them against the sun. For one ounce of grain 65 to 80 *rubbii* of leaves are necessary, which gives 2½ *rubbii* of cocoons and sometimes so far as four. One *rubbio* of cocoons yields 20 to 21 oz. of silk organize, of the price of 18 *liv.* per lb. For gathering the leaves, fron 1*s* 8 *den.* to 2*s.* the *rubbio* is given. The offal (*moresca and choccata*) pays the winding and spinning. They never hatched the worms by artificial heat; using only that of the sun, or of the human body. The common method of carrying on the business is, to provide as in France, grain and mulberries, and to receive half the cocoons. The cultivation is so profitable, that there are many lands to which mulberries add a value of 200 *liv.* or 300 *liv.* more than they would sell for if they contained none; and it is farther thought, that they are but little injurious to corn, the shade not being so prejudicial as that of the walnut and of some other trees. The common estimation of profit is, that trees of all ages yield from the time of beginning to bear, from, 30*s.* to 4 *liv*, each nett to the landlord for his half produce.

Turin.—One ounce of grain gives 2 to 4 *rubbii* of cocoons, and demands 120 *rubbii* of leaves; 1 *rubbio* of cocoons will give 22 oz. of commonly well spun silk. The price of grain 12 *liv.* the oz. when very scarce, but in common 30*s.*; that of leaves 7 or 8*s.* per *rubbio.* Cocoons 21 *liv.* per *rubbio.* When I asked the price of the silk, the answer was, Oh! for that! it is the price the English choose to pay for it. The common price of organzine, 16 to 20 *liv.* first quality; raw, 12 *liv.* For gathering the leaves, 2*s.* per *rubbio* is given. Of the different sorts of mulberry, the wild is the best, in point of quality of silk. A tree of twenty years, will give 24 or 25 *rubbii* of leaves; some to 35 *rubbii.* The trees are grafted in the nursery, and planted out at four years, at the beginning of April; price, 20*s.* to choose out of many; and in four years after, begin to gather. When planted in watered meadows, the gathering damages the hay almost to the value of the leaves, yet many are so planted; and many peasants think they lose in corn by the shade of the trees, as much as they get by them. From the 22d to the 26th of April, is the season for hatching; never by fire; nor have they any method of retarding the hatching, in case of a want of leaves. Endive, lettuce, and elm leaves, have been often tried as a succedaneum, but always killed the worms; such things must never be depended on. The peasants generally sell the cocoons, not one a in hundred spinning. A chamber of twenty feet by twelve feet is necessary for 3 oz. of grain; and six tables, one *trebucco* long and two-thirds wide.

Novara.—Passed this place towards Milan, which is a great tract of mulberries for several miles.

Milanese.—*Buffalora to Manienta.*—Many mulberry hedges, but they are bad and ragged; some new planted in the quincunx position. For several miles, the county is all planted in rows of vines, at tweleve, sixteen, and twenty feet, and fruit trees among them, for their support; among which, are many mulberries, and the vines running up them. This must be a most profitable husbandry indeed, to have silk and wine not only from the same ground but in a manner from the same tree. Between the rows, the ground is cultivated; millet, maiz (cut), *holcus sorgum*, the great millet, lupines, with dung amongst them, to be ploughed in for wheat, with young maiz, sown thick, as if for fodder.

Citricho.—A beautiful mulberry hedge, and in good order; six to eight inches from plant to plant, and cropt at sixteen or eighteen from the ground. It is clear, therefore, that the plant will do, with care, for a good hedge. Towards Milan, mulberries decline, oak and other pollards being found in their stead.

Mozzata.—The culture of mulberries and making silk, being here much attended to were principal objects in my inquiries. The fruit is well washed, the end of June, to make the seed sink; it is then sown in rows, in a bed of earth well manured, and finely laboured, in the rich nurseries near Milan; covered very lightly and the surface lightly flattened; straw is spread to defend it from the sun, and, much water given. When the young plants appear they are weeded by hand. The second year, they grow to two or three feet high, and hoed and thinned. The third year, they are cut to the ground above the buds that are to push, and transplanted from those nurseries, in the vicinity of the city, to others that are scattered all over the country, in ground well dug and manured, and at two feet square; here they are kept clean by hoeing. The fifth year, in the spring, they are cut again to the ground; they then shoot very powerfully, and attention must be given to keep but one good shoot, and the ground is dug or hoed deeper than common, and also dunged. The sixth year, those that are high enough, are grafted; and the rest, the year following. Those that took the sixth year, ought to rest in the nursery three years, including the year of grafting that is, the seventh and eighth year. They do not like to plant large trees, and have a proverb,

Se vuoi far torto al tuo vicinto,
Pianta il moro groffo e il fico piccolino,

As to plant small fig trees is as bad as large mulberries.

The holes are made in winter for receiving them where they are to remain; these are nine feet square and two feet deep, and have at the bottom a bed of broom, bark of trees, or other rubbish; then the best earth that can be had, and on that dung, one load of sixteen feet to four trees; this is covered with more good earth, and this levels the hole with the rest of the field; then prune the roots and plant, setting a pole by the young tree to the north, and a spur post on the other side, to guard it from the plough. Twine no straw the first year, because of the insect *forficula auricularia*, L.; but in November bind straw around them against the cold, or, as straw is dear, the *poa rubra*, which abounds. Never, or very rarely, water. Much attention to remove all buds not tending in the right direction.

The fourth spring after planting, their heads are pollarded, in March, leaving the shoots nine inches long of new wood, and seeking to give them the hollow form of a cup, and that the new buds may afterwards divide into two or three branches, but not more. The next year, they begin to pluck the leaves. They are attentive in pruning, which is done every second year, to preserve as much as they can the cup form, as the leaves are gathered more easily. Thus it is about fourteen years from the seed before the return begins.

After gathering the leaves, a man examines and cuts away all wounded shoots: and if hail damage them, they are cut, let it be at what time of the year it may. Old trees are pruned after gathering, but young ones in March, In autumn, the leaves are never taken for cattle before the 11th of November, as the trees after that time do not suffer. The third year after planting young trees, they sow about a hat-ful of lupines around the stem, and when about ten inches high, dig them in for manure. The opinion here is, that the mulberry does very little harm to rye or wheat, except that when cut the falling of branches and trampling are somewhat injurious. Maiz, millet, and panic are much more hurt. A tree, five years after transplanting, gives 10 lb. of leaves, each 28 oz. At ten years, 18 lb. At fifteen years, 25 lb. At twenty years, 30 lb. At thirty years, 50 lb. At fifty to seventy years, 70 lb. There are trees that give 80 lb. and even 100 lb. The price of leaves is commonly 4 *liv.* per 100 lb. (28 oz.). For one ounce of grain 500 lb. of leaves are necessary, and yield 17 lb. of cocoons: but among the raisings in the mountain of Brianza, 25 lb. To make a pound of silk, of 12 oz. 5 lb. or 6 lb. of cocoons, of 28 oz. are required. Price in the low watered country, 2 *liv.* per lb. (28 oz.). At Mozzata, 2½ *liv.* At Brianza, 3 *liv.* The grain is hatched in a chamber, heated by a chimney, and not a stove, to 17 deg. of Reaumur (70½ Fahr.); but before being placed in this chamber, they are kept eight days under a bed, with a coverlet upon them, in boxes covered with paper pierced: and when hatched, lay the young leaflets of the mulberries on the paper, to entice them out. The method of conducting the business here is the same as in France; the landlord furnishes half the grain, and the peasants half, and they divide the cocoons. Price of grain, 2 *liv.* the ounce. Mulberries, of all ages, are pollarded every second year; a mischievous custom, which makes the trees decay, and lessens their produce; it is never done in Dauphinè, where the culture is so well understood.

Milan.—Sig. Felice Soave made some interesting trials on silk-worms.

At Lambrate, near, Milan, 2 oz. of seed in rooms, kept to the heat of 23 and 24 deg. Reaumur, hatched well, and kept healthy: the 28th of April, the seed was placed in the rooms, and hatched in the third, fourth, and fifth day: the 21st of May, the first cocoon seen, and at the end of the month all were at work. The product gathered the 3d of June; the product 92½ lb. cocoons (28 oz.); eighty-four of them having been spun from four and five cocoons, gave 20½ lb. (12 oz.) of silk, stronger and more shining than common; the consumption of leaves, 1420 lb. of 28 oz. Wood used for fire, 2800 lb.; but the two rooms would have served for 4 oz. of seed. In the common method, without stoves, the consumption of leaves is 500 lb. for an ounce of seed, and the medium product is not above 15 lb. of cocoons; and by this new method, the counsumption of leaves has been 710 lb. each ounce, and the produce 46½ lb. cocoons. Sixteen or seventeen cocoons weigh an ounce in the common method, but in this only thirteen or fourteen. The silk cannot commonly be spun from five or six cocoons; these were spun easily from four or five, and might have been done from three or four. To gain a pound of silk, in common, 5 lb. of cocoons are necessary; but here the same quantity has been gained from 4 lb.

Lodi to Codogno.—In this dead level and watered district, there are very few mulberries; none except near the villages; many of them, not all, appear unhealthy; perhaps by reason of their not exerting the same attention as in Dauphiné, where there is, in irrigated meadows, mounds made to keep the water from these trees.

Codogno to Crema.—Mulberry trees here have large heads, as in Dauphinè, instead of being pollarded incessantly, as to the north of Milan.

There is an idea in the Milanese, that silk was introduced by Ludovico il Moro. Francesco Muralto reports, "Prædia inculta infinita duobus fluminibus ad novalia (Ludovicus), reduxit infinitas plantas Moronum sad conficiendas etas, seu sericas plantari fecerat et illius artis in ducatu, primus fuit auctor." It is said to have been introduced into Europe bo some Basilian monks, from Sirinda, a city of Indoston, to Constantinople, under the Emperor Justinian, in the year 550, by one account; and by another, in 525. In 1315, the manufactory of silk was brought in Florence to great perfection, by the refugees of Lucca; but during the fifteenth century, no silk was made in Tuscany; for all used in that period was foreign, silk-worms being then unknown. In 1474, they had eighty-four shops that wrought gold and silver brocaded silks, which were exported to Lyons, Geneva, Spain, England, Germany, Turkey, Barbary, Asia, &c. Roger I. King of Sicily, about the year 1146, having conquered some Grecian cities, brought the silk weavers from thence into Palermo; and the manufacture was soon imitated by the people of Lucca, who took a bale of silk for their arms, with the inscription—*Dei munus diligenter curandum pro vita multorum.* In 1525, the silk manufacture at Milan employed twenty-five thousand people; and it seems to have augmented till 1558. In 1423, the republic of Florence took off the duty of entrée upon mulberry leaves, and prohibited the exportation; and some communities of Tuscany have records concerning silk anterior to that period.

In almost all the districts of the Milanese, mulberry trees are met with, very old, with towering branches; among which are those of Sforzesca, planted under Ludovico il Moro, who lived at the end of the fifteenth century.

VENETIAN STATE.—*Vaprio to Bergamo.*—There are many mulberries, mixed with the cultivation of corn and vines, in this tract of country.

Bergamo.—Four ounces of seed are here given to each poor family, which yield four *pesi* of cocoons.

Brescia.—One hundred *pesi* of leaves are necessary to 1 oz. of seed; and four *pesi* of *bozzoli*, or cocoons, are the produce of 1 oz.; and the *peso* of cocoons gives 28 to 30 oz. of silk. Cocoons sell at 45 *liv.* per *peso.* Leaves at 1 *liv.*; and silk at 22 *liv.* per lb. The trees are lopped every three years; yet some are known that give 20 *pesi* of leaves. Small ones half a *peso*, and one *peso.*

Verona.—One ounce of seed demands seventeen or eighteen *sacchi* of leaves, each one hundred Veronese pounds (or 74 lb. English). Twelve ounces of seed are given to each family; and each ounce returns 60 lb. of cocoons, at 12 oz. the lb.; the price 24 *sous* the lb. To each ounce of seed sixteen to eighteen *sacchi* of leaves, each 100 lb. of 12 oz., are necessary. The 60 lb. cocoons, at 24s. are 72 *liv.* or 36 shillings; which is the produce of eight trees, or 4s. 6d. a tree, the half of which is 2s. 3d. It must however be remarked, that these prices of cocoons vary so much, that no rule can be drawn from them; this price of 24s. the pound is very low, and must arise from some local circumstance. One ounce of silk to one pound of cocoons. They are here, as in the preceding districts, in the custom of finding the trees, and half the seed, and the peasants the rest; and they divide the cocoons. A tree of forty years old will give four *sacchi*; and if a plantation consist of one thousand trees, they will, one with another, give two *sacchi.* They make silk in the Veronese to the amount of a million of pounds of 12 oz. There are, near the city, some trees in a rich arable field seventy years old, that yield from four to six sacks of leaves each; this is about 10s. a tree at the lowest price of cocoons.

To Vicenza.—There are many rows of mulberries in the meadows, that are never dug around, and yet quite healthy, which proves that they might be scattered successfully about grass-lands, if any proof were wanting of so undoubted a fact. In the arable lands, the soil all gravel, they are planted twelve ridges apart. Some of the trees are old, that spread seven or eight yards across.

Vicenza.—The produce of silk amounts here to about 6 *liv.* the *campo*, over a whole farm; this is about 3s. an acre. The *sacca* of leaves weigh 75 lb. and forty *sacchi* are necessary for one ounce of seed; which gives 100 lb. of cocoons, and 10 lb. of silk. One hundred trees, of twenty years old, yield forty *sacchi;* price 3 *liv.* to 11 *liv.*; commonly 3 *liv.* Price of cocoons 30s. to 50s. the pound.

I was glad here to meet with some intelligence concerning the new silk worm, said to have come from Persia, which they have had here eight years, but is in the hands of so few persons, that I could get none of the seed; and I suspect that it is lost; for, on repeated inquiries, I was referred to other parts of Italy. While they had this worm, they had four crops of cocoons a year:—1. In the beginning of June. 2. The end of the same month. 3. The middle of August. 4. In October. This worm is essentially different from the common ones in the circumstance of hatching; no art will hatch the eggs of the common sort the first year, that is, the year of the flies dropping them; they can be hatched the year following only; but of this new sort, the eggs will hatch in fifteen days the same year, if they be in the proper heat. But it is to be observed, that they use this sort of worm not really to command several crops in the same year, for mulberry trees will not bear it without destruction; but merely as a succedaneum to the common sort of worms, if by frosts in the spring they be lost for want of food; this new sort is in reserve, to apply the leaves to profit once in the year. Theoretically the plan is good; but there must have been something in practice against it, or we may conjecture that after many years the use of them would have been generally introduced.

This will not be an improper place to introduce some remarks on this subject, by an author much esteemed, but quite unknown in England. It appears from the work of Count Carlo Bettoni, of Brescia, that the discovery of the new silk worm arose from experiments made with a view of finding out a cure for the sickness of mulberry trees, called *moria*; this was supposed to arise from stripping the leaves in the spring annually; it was thought, that if some means could be discovered of postponing the gathering much later in the year, it would greatly favor the vegetation and health of the trees; an effect that could only take place by means of a worm that would hatch much later than the common one. In 1765, a second hatching of the eggs of the common worm is said, by the same author, to have been made; part of which were fed with the second growth of leaves, and part with the leaves of trees that had not been gathered in the spring. Those fed with the old leaves gave a greater number of cocoons, and of a better quality than the others. These experiments were repeated by many persons; and it was found, that in the heats of July and August the worms would not do well; but in September much better, and that the trees did not suffer from having their leaves gathered in September. The same author says, that the new worms (which he calls *forestieri*) will hatch three times a year, and that no art will prevent it; no cellars, no cold, will keep them from it, though it may retard them some time, as he tried in an ice-house, by which means he kept them inert till August. But, on the contrary, the common sort cannot in general be hatched a second time the same year, even with any heat that can be given; yet he admits, that they were hatched by certain persons in 1765. The new ones sleep four times, like the common ones, but begin to spin their cocoons five or six days sooner: they eat less in quantity, but gives lefs silk; and as this defect is balanced by the advantage in food, they ought not, says the Count, to be proscribed. Their cocoons are small, but the consistency is good and fine; and their silk is fine, and softer than the common: he sold it for 4 *liv.* or 5 *liv.* a pound more than common silk. There is however, an evil attends them, which is the uncertainty of their hatching the second and third time; sometimes all the seed will hatch, but at others only a part; even only the seventh and tenth of the quantity: but the first hatching is regular, like that of the common worms. A circumstance in the course of his trials deserves noting, that he found the worms of both the old and new sorts would drink water when offered to them, and that the cocoons were the larger for their having had the water.

They have had a sort in Tuscany that hatches twice a year; and the Count writing thither for information concerning them, found that their silk was coarser than the common, and of lefs value; and he judges them to be a different kind from his own, which hatches three times. The Count concludes nothing determinate concerning them; but resolves to continue his numerous experiments and observations. As there may be persons who think, as I did at first, when I heard of this sort of worm, that if any succeed in England it would probably be this. It is proper to observe, that Count Bettoni had nothing in view but the diseases of the mulberry trees, and does not seem to have had at all in contemplation the evils attending late frosts depriving the worms of their usual food; and if the common sort may be retarded in hatching (which he shows) till August, equally with the new sort, there does not seem to be any extraordinary advantage in this sort, for a northerly climate, more than in the others. The Count's book was printed at Venice in 1778.

Sig. Pieropan has made an observation, which deserves noting; mulberries, and likewise other trees are generally found to succeed much better when grafted a little before sun-set than at any other time: the reason he attributes to the heat of the earth after sun-set; he kept a journal some years, of the comparative heat of the atmosphere and the earth, at the depths of four, twelve, and twenty-four inches; and has found, that immediately after the setting of the sun the mercury in those thermometers under ground had always risen some degrees gradually till the rising of the sun, when it as regularly falls.

The following is the Account of the Profit and Loss of Six Ounces of Seed, for Three Years, at Vicenza, by Sig. Carlo Modena.

1778.

Expenses.	*liv.*	*s.*	*den.*
Semenza—seed, 6 oz. - -	36	0	0
Foglia—leaves, 26,475 lb. - -	1545	4	0
Spesa—gathering leaves and attendance, - - - -	866	16	0
Filare—spinning 992 lb. cocoons,			

which give 159 lb. 5 oz. silk, -	557	18	0
	3007	18	0

Produce.

159 lb. 5 oz. of silk, - -	4144	15	0
Refuse ditto, 41 lb. - -	102	10	0
Seed, 55 oz. - - -	330	0	0
	4577	5	0
Expense, - - -	3007	18	0
Profit, - - -	1569	7	0

1779.

Expenses.

Seed, six ounces, half given to the peasants, three ounces, - -	18	0	0
Leaves, 15,607 lb. - - -	753	9	0
Spinning—the produce 446 lb. cocoons, half of which, 223 lb. to the proprietor, 29 lb. of silk, -	101	10	0
	872	19	0

Produce.

29 lb. of silk, -	754	0	0
Refuse ditto, -	21	2	0
	775	2	0
Loss, - - - - -	97	17	0

1780.—Upon his own account.

Expenses.	*liv.*	*f.*	*den.*
Seed, 6 oz. - - - - -	36	0	0
Leaves, 370 sacks, - - -	957	13	0
Gathering and attendance, -	1303	12	0
Spinning 910 lb. of cocoons, -	265	0	0
Reducing 118 lb. 6 oz, of silk into *organzine*, - - - - -	451	10	0
	3013	15	0

Produce.

Refuse silk, - - - - -	116	4	0
118 lb. 6 oz. of organzine, -	4325	5	0
Leaves sold, - - - -	28	0	0
Silk kapt for own use, 2 lb. 8 oz.	49	10	0
	4518	19	0
Expenses, - - -	3013	15	0
Profit, - - - -	1505	4	0

This year the profit would have been much greater; but through the negligence of the women in the night, not attending to the degrees of heat (from 25 to 27 deg. Reaumur), many were suffocated.

To Padua.—One ounce of seed gives 60 lb. of *galetta* (cocoons), and 8 lb. to 10 lb. of *galetta* 1 lb. of silk: the ounce of seed requires sixteen sacks of leaves, of four *pesi*, each 25 lb.; and twelve small trees yield one sack, but one great tree has been known to yield six sacks. Price of gathering, 20*s*. the sack. Expense of making 60 lb. of silk, 250 *liv*. Spinning, 30*s*. the pound. Cocoons sell at 30*s*. to 36*s*. Silk this year, 25 *liv*. the pound, *sotile*.

Padua.—One ounce of seed gives in common 30 lb. of cocoons, and 8 lb. of cocoons 1 lb. of silk: twenty sacks, of 80 lb. of leaves, are necessary to feed the worms of an ounce of seed. Price of gathering, 20*s*. the sack. The greatest trees give ten sacks of leaves each; a tree of twenty years, four or five sacks. It is not the general custom to divide this business with the peasants. The common sort of silk worm is hatched about the 5th of April; the others the middle of June; but silk demands a more expensive operation in the latter season.

Venice.—There are three sorts of silk worms:—1. The common one, which casts its epiderm, or sleeps as it is called, four times. 2. A sort known at Verona, that casts only three times; the cocoons smaller than those of the other sort. 3. The new sort mentioned by Count Carlo Bettoni, the seed of which hatch two or three times a year, but the others only once. The seed of the two first sorts cannot be hatched the same year it is dropped; but that of the third will hatch of itself, if it be not carefully kept in a cool place.

Bologna.—One hundred pounds of cocoons are made from 1 oz. of seed, and yield 7½ lb. to 8½ lb. of silk, of 12 oz. Price of cocoons, 20 to 25 *baiocca*. Silk, 34 *pauls*, at 6d. the pound.

TUSCANY.—*Florence.*—Making inquiries here concerning the new sort of silk worm, I found that they were not, as I had been before told, a new discovery in Italy, but known long ago; and, what is remarkable, is prohibited by law, in order to preserve the mulberry trees from being stripped more than once. The silk made from them is not more than half as good as the common, and very inferior in quantity also. They assert here, that by means of heat they can hatch the the eggs of the common sort when they please, but not for any use, as they die directly; which is not the case with the new spicecia, or that as it is called *di trè volte*.

Their contrivance for winding silk is very convenient, and well adapted to save labor; one man turns, for a whole row of coppers, the fires for those which are without the wall; and the closets with small boilers of water, for killing the animal in its cocoon by steam, are equally well adapted.

At Martelli, near Florence, on a farm of 190 *stiori* (34 acres) there are forty or fifty mulberries, enough for 1 oz of grain, which gives 50 lb. or 60 lb. of cocoons, and 6 lb. or 7 lb. of silk. Price of cocoons this year, 2 *pauls* the pound; last year 2½; and in 1787 it was 3 *pauls*. In the culture of the trees they do not practice such attentions as the French in Dauphiné; they never dig about them, except when young; never wash the the stems; they prune the trees when necessary, but not by any rule of years. The best sort is the wild mulberry, but it yields the least quantity; next, the white fruit.

In 1682, Sig. Don Gio. Agemi di Giun, prelate of the Greek Catholic church, on Mount Libanus, exhibited to the academicians Georgofili of Florence, the 4th of December, some silk worms, in number, thirty eight, part of which had already made their cocoons, and part ready to make them, as accustomed to do on his own country, with the leaves of the wild mulberry. The seed was hatched in October; the worm fed with leaves, procured from warm gardens; cocoons were made in November; mallow leaves, were used also.

Modena.—The export of silk from the city 46,000 lb. at 38 *liv.* (4d. each); from the whole territory, 60,000 *zecchini*.

Piedmont.—*Pavese.*—Immediatley on entering the dominions of the King of Sardinia, within two miles of St. Giovanne, mulberries are found regularly every where, and continue to Turin. Seven eighths of them are about twenty or twenty-five years old; some however are amongst the largest I have seen.

EFFECTS OF FRAUDULENT BANKING AND PAPER MONEY ON AGRICULTURAL INTERESTS.

To the Editor of the Farmers' Register.

Alabama, April 19th, 1839.

* * * * * * *

You speak frequently of agricultural humbugs! How long will it be before the intelligent laboring and agricultural classes, (such for example as read the Farmers' Register,) will find out that the paper system is the greatest humbug which ever deluded and cheated labor out of its hard and honest earnings? The crisis of another general bank explosion is hastening to a consummation, and cannot be postponed more than a twelve month at farthest. Nothing but the rising price of cotton has prevented it until this time. But come it will, to plunder agriculture out of untold millions. Will not such a catastrophe convince the unprivileged classes of the utter folly of giving an uniform value to paper money, which is issued in the excess of four, five, and even sometimes as high as ten-times the specie which it *purports* to represent? Will not the cotton planter realize the disadvantage of selling at hard money prices, while he produces at expanded paper prices? Will not the manufacturer learn the difficulty of competing, under the bloated cost of labor and production in this country, with the cheaper labor of other countries—cheaper because paid for in a sounder currency. Will not all, who have not by chartered privileges, evaded the common destiny of humanity, "that by the sweat of the brow man shall earn his bread," learn that gold and silver is the only true measure of value, and therefore, the only sound currency, which needs no regulation, but to fix its quantity; that its value is regulated by the law of no country, but by the immutable law of supply and demand throughout the world; and that with a uniform measure of value, this country with its advantages of soil, climate, and free institutions, can, by the untrammelled exchange of labor with other countries, become the richest country on the globe. Until this reform in thinking on the subject of bank and bank paper, can be effected, and the cultivators of the soil shall issue their *fiat* against making the promises of banks, and the credit which the law gives them, an equivalent for the productions of the soil, agriculture must languish, in spite of all your truly praise-worthy efforts. It is, indeed, a hardy plant, but it droops in the shade of a paper aristocracy, whose branches are more dense, broad and towering than are those of the nobility of good old plundered and tax-ridden England. I should like to see some strong hand attempt to sketch the contributions which the paper system has levied on the labor of this country, and to institute the comparison which John Taylor, of Caroline, suggested, between the expense of sustaining the rag barons of this country, and the nobility of England.

TO PREVENT CROWS FROM PULLING UP CORN.

From the Maine Farmer.

Soak seed-corn in a solution of Glauber salts from twenty-four to forty-eight hours before planting, and no living animal having the sense of tasting will eat it. This method of preventing crows from destroying corn was accidentally discovered by John B. Swasey, esq., of Meredith, N. H. several years since. He directed his hired man to soak a quantity of seed corn preparatory to planting, in a solution of saltpetre, by mistake glauber salts were taken for nitre; the mistake was not discovered till it was nearly all planted. The piece of ground was finished with dry corn. That part of the piece planted with soaked corn remained undisturbed, while the dry corn was nearly all destroyed by the crows, black birds, and squirrels.

Piscataquis.

April 19, 1839.

CONDITION AND PROSPECTS OF AGRICULTURE IN JAMACA.

From a Pensacola Paper.

For the following interesting communication we are indebted to an officer of the U. S. ship of war Natchez. It embodies the views of a disinterested and highly cultivated mind on a subject of the greatest possible importance, and commends itself to the attention of the reader as being the result of actual observation.

Dear Sir: I had recently the pleasure of visiting the island of Jamaica, and an opportunity of seeing the new state of things, in that island, produced by the emancipation of the negroes. The contradictory representations which I had seen, prepared me to expect a great deal of angry excitement on this subject; and in this expectation I was not disappointed. All controversies, whatever their original complexion, are soon merged into this all absorbing topic. The old residents, the party most materially concerned, seem to be highly dissatisfied with the present state of things, and well may they be, for in it they see the wreck of their fortunes, and all their brilliant expectations. The loss, sustained by being deprived of their negroes, could be borne, were they able to carry on their planting business; but though seduced for a time into the belief that they would be able, with a reasonable compensation, to avail themselves of the voluntary labor of the blacks, yet experience soon demonstrated the fallacy of that supposition, and in the attempt to continue the sugar and coffee planting many have sustained heavy losses. The present crop is almost an entire failure, and the next must be worse. In fact it is evident to those who have made the experiment in the island, that the cultivation of the two great staples, sugar and coffee, must be abandoned. The continued and persevering labor required for their production cannot be secured under the voluntary system. Though the very highest prices have been offered during the past season, yet labor could not be procured, and the planter had the mortification to see his cane rot in the field.

It seems that the expectation of the English government has been that the negroes would continue the laboring part of the population, and that the planters, for a small compensation, would be able to direct their labor; and to this end it seems most of their laws and regulations for the island have been framed. But though such an idea may have been conceived by those acquainted with the English only, (who in fact are but appendages of the soil, and who feel a dependence on the farmer involving a state of slavery almost as absolute as that which exists between master and slave,) yet no legislation, other than that establishing absolute slavery, can create such a state of things in the island of Jamaica. Placed within the tropics, in a climate relaxing, enervating, and indisposing to exertion, where the various fruits and esculent roots, produced almost without labor, and the most appropriate and pleasant sustenance, and where clothes and the ornaments of dress are but an incumbrance, man is free to labor, or consult his ease, without the fear of starvation. Such is not the case in England; provision must be made for a long and severe winter, clothing, fuel, shelter and wherewithal to keep soul and body together; this it is which brings the laborer in such absolute subservience to the farmer. The planters of Jamaica must be considered peculiarly unfortunate, induced to purchase land and populate it with negroes under the particular patronage of the government, and finally abandoned by that government to the tender mercies of a puritanical tribe, who under the cloak of religion are carrying disorder and confusion in the very bosom of society. The state of the country is already such as to induce the governor to abolish the militia, he deeming it unsafe that a part of the population should be entrusted with arms, where so much excitement exists. I learned that it was in contemplation to man the forts on the sea coast with black soldiers, regularly enlisted, and remove the English to the mountain barracks, by which their health and comfort would be promoted. This may be but the beginning of a more general use of the blacks for soldiers, and in a particular emergency they might avail the English something, as their sacrifice would be an object of but small consideration with those who have taken them under their fostering care.

EXPERIMENTS ON CARROTS.

By the Rev. Mr. Carter, of Flempton, Suffolk.

From Young's Annals of Agriculture.

The soil on which the following trials were made is sand, about 18 inches deep, upon an imperfect clay bottom.

1771.—March 18th, sowed one acre with carrot-seed; April 5th another; and the end of the month a third: four pound of seed per acre. Began to hoe May 27th; put out an acre at 1*l.* 1*s.* but the workmen found the plants so very small and full of weeds, that they could not go on by the acre, which obliged me to get them hoed by the day at 1*s.* 5*d.* a man. Carrots generally come to the hoe in seven weeks from sowing. The reason of mine being longer, I apprehend to be partly from a cold backward spring, and partly from the seed being old. New seed is a very material article in order to succeed in a carrot crop. It will come up a week sooner than the old seed, and consequently the crop will get a week's advantage of the weeds, much to the benefit of hoeing, upon which operation the whole difficulty of succeeding is placed. N. B. it is better to sow five pounds instead of four of seed per acre, in order to guard against a bad season or bad seed; and the hoers, from the smallness of the plants, are more apt to leave too few than too many. As it is very difficult to be sure of getting new seed from gardeners, it would answer very well to any one who intends cultivating carrots to grow his own seed; this I attempted afterwards, but the hares eating the roots up, I got it from Wethersfield in Essex, where I have always been supplied with good seed, the price varying from 6*d.* to 2*s.* 6*d.* a pound. Hoeing two acres and a half by workmen at 1*s.* 4*d.* a day, cost me 3*l.* 14*s.* or 1*l.* 12*s.* per acre. Run them over a third time by my harvest-men, worth about 2*s.* an acre. October 10th, began to take up the crop which I let out to the workmen at three farthings a bushel, topping, tailing, and measuring included. *Mem.* One half-penny is good pay for it, and has always been taken at that price since by the workmen. Product of the two acres and a half, 851 bushels, sold at 8*d.* per bushel. All expenses paid I cleared 20*l.*

1772.—Sowed one acre and a quarter, March 24th, six pounds seed per acre; April 10th, three acres more 4½ pounds per acre; began to hoe June 1st, at 30*s.* per acre, twice hoeing. *Mem.* Hoed about 10 rod per man per day. June 11th, harrowed one acre after being hoed a week, but tore up many young carrots, and did considerable damage. August 1st, began to hand-weed by women at 1*s.* per acre. October 27th, began to take them up at one half-penny a bushel, topping, &c. included; finished November 14th. Total produce 1040 bushels, or 250 per acre.

Expenses.

Hoeing as above, - - - - - -	£6	7	6
Weeding, - - - - - -	0	4	3
Taking up, - - - - - -	2	3	4
24 pounds of seed at 2*s.* - - -	2	8	0
	11	3	1
1000 Bushels sold at 9*d.* - -	37	10	0
Reserved 40 bushels, - - -	1	10	0
	39	0	0
Expenses, - - - - - -	11	3	1
Profit, - - - - - - -	27	16	11
Or, per acre, - - - - -	6	11	5

Mem. My man thinks that six bushels of carrots do not more than equal one of oats for horses; in which case the value of carrots is 4*d.* a bushel oats being 2*s.*

1773.—Februrary 2nd, sowed one acre and 20 rod with 10 pounds of seed; began to hoe May

14th, the weather turned out very rainy, so that they could not finish till the 29th. Part of it let out at 2*d.* per rod the first hoeing; the rest by the day, at 1*s.* 4*d.* a man, cost rather more than 1½*d.* per rod. June 7th, began to hoe a second time at 1*s.* 4*d.* a day; cost 18*s.* or not quite 1½*d.* per rod, or per acre 16*s.* 8*d.* First hoeing 1*l.* Began to take up October 25th, at ½*d.* per bushel. Produce 455 bushels, sold at 6d. a bushel.

1779.—Began to sow one acre April 22nd. Began to hoe June 1st, and continued it occasionally till August. Produce, besides many stolen, 368 bushels: sold to Lord Grosvenor at Newmarket, for 8*d.* a bushel, paid 2*d.* for carriage, 6*d.* therefore nett.

The carrots were given to hogs more than once; some seemed to thrive tolerably for a time; with others they were prejudicial. Upon the whole, I can value carrots for hogs at not more than 3*d.* and not to be depended on at any price. They are better for horses than for hogs, especially for such as are broken-winded; but not to be relied on as a food instead of oats, being chiefly to be considered as a luxury or physic.

In respect to their effect for succeeding crops, the soil is light and sandy, and consequently very subject to spear grass (*triticum repens*) which hoeing rather increases than destroys; and I could never find that the land was in order for barley to lay down with clover, so that I have generally sowed them after wheat, in order for the turnips to follow; and have found much labor necessary to free the land from the spear grass. In a word, they can never be introduced in courses, as turnips are; to sell, they are highly advantageous, but the demand is nothing: the culture should, therefore, be confined to a small space of land for the particular uses I have just mentioned.*

Observations. By the Editor.

My own experience in the culture of this root is rather different from my friend's, in several particulars; but this by no means impeaches either his practice or mine, for our soils are equally different. I have found carrots to clean the land better, I think, than any other crop I cultivate, and had the pleasure, two years ago, of showing a crop of barley to Mr. Carter after them, that was absolutely clean. But I am very little troubled with spear-grass, which certainly multiplies in sand vastly more than in other soils, and accounts for the different results of our trials. The great object is the value of the root consumed at home. Mr. Carter's expenses may be thus calculated.

Seed, five pounds at 1*s.* and sowing,		£0	5	6
Hoeing, 1771,	£1 14 0 per acre,			
1772,	1 11 0	1	14	0
1773,	1 16 8			
Average of the three.				
		1	19	6
Taking up, at ½*d.* per bush.				
crop of 1771, per acre	283			
1772,	250			
1773,	404			
1779,	368			
Average 326 bush. which at ½*d.* are,		0	13	7
Suppose rent, &c. &c. to be		0	10	0
		£3	3	1

The crop at 326 bushels, the prime cost of the carrots is something better than 2¼*d.* per bushel. Suppose them consumed at home, to pay 4*d.* per bushel, the profit would be 1¾*d.*, or per acre (at 326 bushels) 2*l.* 7*s.* 6*d.* which would answer perfectly well. *Are they worth 4d.? Fiat experimentum.*

If ever Mr. Carter makes any trials to ascertain this point, I have no doubt of their being very valuable, since no man is more accurate or more attentive. A. Y.

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* I should observe, that Mr. Carter did not draw up this account with any intention of printing it, but merely for his own private use; I persuaded him to let me copy it for this work; it is accordingly transcribed verbatim from the journal-book of his farm.

METHOD OF PERFORATING GLASS.

By Mr. Albrecht.

Put a drop of spirits of turpentine on the place where the hole is to be made, and in the middle of this drop a small piece of camphor. The hole can then be made without difficulty by means of a well tempered borer or a triangular file. Solid turpentine answers as well as a mixture of the oil or spirit and camphor.—*Annales des Mines.*

THE DEEPEST ARTESIAN WELL.

From the Mining Journal.

The bore which has been going on for so long a period near Paris, has now reached the depth of 410 metres (or about 1345 feet) and the funds being exhausted, M. Elie de Beaumont has been requested to examine the matters lately brought up by the auger, and to say whether they afford any indication by which the thickness of the bed to be pierced, before arriving at the sand, may be gathered. M. de Beaumont has accordingly given his opinion, that the bore has reached the lower beds of the chalk formation, and that the marls and gault which still intervene between the bore and the stratum where the water will be found, will, probably, be less than 100 metres thick, (328 feet.) If M. de Beaumont's anticipation should prove correct, the well should have a depth of 1600 feet, at which depth, according to recent calculations, the water should have a temperature sufficiently high to furnish Paris with an abundant supply of hot water for baths and for many other purposes.

NATURAL DISCHARGE OF INFLAMMABLE GAS.

From the American Journal of Science.

Inflammable Gas—Carburetted Hydrogen.

Disengaged in many places—at Albany, from a boring in the slate, where a saline carbonated water is discharged—at the Oneida springs in Vernon—in the Ontario gas springs, on both sides of the Canandaigua lake—in Bristol, nine miles from the village, and within three miles of it—in the Niagara gas springs near Lockport, and so abundantly in a particular place, that it has been called Gasport.

Most remarkable in Fredonia, Chautauque county, three miles south of lake Erie, from the bituminous slate under Canadanea Creek. Bubbles of gas every where rise though the water, and most abundantly at and below the bridge. The gas burns with a white flame, tinged with yellow above and with blue below the burner.

"The illuminating power of this gas and its abundant supply, suggested the idea of its employment in lighting the village. A copious discharge of the gas was observed issuing from a fissure in the rock which forms the bed of the creek, which it was thought could be diverted to a boring on the bank. A shaft was accordingly sunk through the slate about twenty-two feet in depth, which occasionally passed through layers of the bituminous substance already described, and the result was, that the gas left the creek and issued through the shaft. By means of a tube, the gas was now conducted to a gasometer, and from thence to different parts of the village. The gasometer had a capacity of about two hundred and twenty cubic feet, and was usually filled in about fifteen hours, affording a sufficient supply of gas for seventy or eighty lights."

Besides the bituminous slate, burning with a flame like that of the gas, there is an alternating sand-stone, containing every where small cavities filled with petroleum, and giving out a bituminous odor. This liquid substance appears to have been every where originally diffused through both the slate and sand-stone, and thus to have imparted the peculiar characters.

Gas appears to be generated and imprisoned below. It rises in the banks when they are bored to the depth of twenty to thirty feet, and it bubbles up through the water when it is low, but is repressed when its height produces increased hydrostatic pressure. Many of the wells in Fredonia are strongly charged with this gas, and frequent disruptions of the strata evince the exertion of an expansive force from below. The strata of slate and sand-stone are one thousand feet thick. This gas issues at long distances, whose extremes are four hundred miles apart, and from strata from fifteen hundred to 2000 feet thick. It is the opinion of Dr. Beck, that this gas does not rise from coal beds, which by the views now entertained of the geological structure of New York, are excluded from its territory.

THE MARL INDICATOR, NOT A NEW SPECIES.

To the Editor of the Farmers' Register.

To a person who has any skill in the science of botany, or even a taste for it, the introduction of a new plant to his notice is a very welcome treat. A few years ago, when I was leisurely strolling along the banks of the Niagara river, from Lewiston to the falls, I perceived a beautiful plant in full bloom on the very bank of the precipice. It was entirely new to me, as well as to a gentleman who was with me, who was a far more experienced botanist than myself. Of course, we made no attempt to obtain it; but its image has revisited me a hundred times since.

I offer this preface, by way of apology, for adding another notice to the several which have already been presented, of the "marl indicator." Your correspondent who furnished the description at page 456, of the last volume of the Farmers' Register—which is very creditably drawn up, and deficient in only one particular—appears to consider it an entirely new species. From its habitat, I had no reason to suppose it would come under my observation; but as it was intimated, on the authority of Loudon, that there is only *one* American species of *veronica*, and our books enumerate as many as *ten* or *twelve*, I was induced to pursue the subject by sending the description and engraving to some persons who might probably be acquainted with the plant. The result of the inquiry is now given; and it is interesting to find that though the species extends to other portions of the country, *its existence appears to be confined to the lime-stone region.*

That, the "marl indicator" is a *veronica*, is obvious enough; but there are two species which bear such a strong resemblance to each other, in habits as well as appearance, that there is some difficulty in determining between them. An accomplished lady in Pennsylvania, pronounces it to be *veronica anagallis*, which Dr. Darlington in his 'Flora Cestrica' describes as follows: "Stem erect; leaves amplexicaul, lanceolate, acute, denticulate; racemes opposite. Vulgar—water speedwell, long-leaved brooklime.

"*Root perennial*, with verticals of numerous long capillary radicals at the lower nodes of the stem. *Stem* 12 to 18 inches high, rather coarse and fleshy, sometimes with a roughish pubescence. *Leaves* smooth, closely sessile and embracing the stem, narrow lanceolate, 2 to 3 inches long and tapering gradually to a point, sparingly denticulate, often nearly entire. *Racemes* mostly opposite on stout succulent peduncles; *bracts* linear lanceolate, as long as the pedicels. *Corolla* pale blue, with purple stripes. Capsule tumid. Habitat, muddy margins of rivulets, Great Valley, Chester county, Pa., lime-stone region; rare; flowers June to August."

The other species is *V. beccabunga;* and in support of the opinion that the marl indicator is identical with this plant, I quote the words of one of the first botanists in the country.

"I have looked at the *marl indicator*, and am rather inclining to the opinion that it is no other than the American variety of *veronica beccabunga.* This plant is decidedly indigenous, growing in our *runs* (in the lime-stone region of New-York) "wherever the supply of water is constant. * * * pronounced it to be this plant at the first glance. I have, however, compared the drawing with Dr. Darlington's *description* in his 'Flora Cestrica' (a work remarkable for its accuracy); and by copying a part, you will be enabled to judge as well as myself. 'Whole plant glabrous. *Root* perennial. *Leaves* often sub-cordate at base, decurrent on the petiole, generally acute, lowest ones obtuse. *Racemes* opposite, erect, long and slender. Hab. Muddy springs and rivulets. Obs. This plant is somewhat variant from the European species of the same name; the leaves being generally acute, more lanceolate, and more distinctly serrate. The late Mr. Schweinitz considered it a distinct species, and named it *V. intermedia* in 'Silliman's Journal,' though in his herbarium, at the Philadelphia academy, it is labelled *V. Americana.* It is, however, closely allied to the *V. beccabunga* of Europe.'

"Allow me to remark that the *specific characters* in Loudon are, in very many cases, entirely insufficient to enable us to determine the identity of a plant. I have no doubt of their having been prepared with great labor; but from the circumstance that most of them were drawn from garden specimens subject to *variation*, I do not value them very highly."

Had the correspondent of the Farmers' Register stated in his description, to what extent the plant was smooth or pubescent, the identical species might perhaps have been accurately determined. **Clayton.**

SUPERIORITY OF BLUE MARL.

To the Editor of the Farmers' Register.

Lowndes, Alabama.

I see in your last No. a suggestion that blue marl contains an enriching substance, beyond the lime which is found in it. Of this, I have for years been convinced. I have known it to give more support to crops for four successive years, than even stable manure. The best row of cotton I ever saw, was on a ridge of blue marl dug out of a ditch four feet deep, and when thrown out of the ditch looked like poor blue clay mixed with lime. By exposure to the sun and air, it became black, and richer in appearance, and is now the most productive spot in a body of as rich land as there is in the state. Its superiority is probably increased by its elevation over the adjoining land, particularly for cotton. I should certainly like to see an analysis of blue marl by Prof. Rogers or Ducatel. With great respect, I am,

My dear sir, your friend,
And obedient servant,
Dixon H. Lewis.

OBSERVATIONS MADE IN ITALY ON THE USE OF LEAVES IN FEEDING CATTLE.

By John Symonds, L. L. D. Professor of Modern History in the University of Cambrdge.

From the Annals of Agriculture.

Among the various kinds of winter-food provided for cattle in Italy, the use of leaves is not the least considerable. This branch of husbandry was introduced a few years ago in the Ferrarese; and is adopted universally in Italy, except in the dutchy of Mantua, which of all countries seems to stand most in need of it; for, as the landlords have suffered most of the pastures to be broken up, and as the culture of artificial grasses is little understood, the cattle subsist more precariously during the winter, than in any other part of Italy. The city of Rome is furnished chiefly with oxen from the territory of Perugia; and the Roman markets are known to be plentifully supplied with beef of a very good quality; yet, so scarce is hay in the territory above-mentioned, that the oxen have no other sustenance in the winter than turnips and leaves; but the turnip husbandry is so ill executed, that I did not wonder the peasants assured me, that they placed no small dependence upon leaves. Indeed it is esteemed so important an object in Italian agriculture, that substantial advantages are often sacrificed to it; for, instead of supporting their vines by stakes, and keeping them very low, in order that the grapes might receive more heat, and attain to full perfection, they support them for the most part with trees, not more with a view of providing themselves with fuel, than of reserving the leaves for their cattle. Elms and poplars are most commonly planted for this purpose in Lombardy; but the latter are more frequent in the kingdom of Naples, where they are suffered to grow to an astonishing height. The common ash is sometimes used as a stay for vines; though the flowering ash[*] is generally preferred to it: the manna-tree[†], as it is vulgarly called, is never applied to this use, being confined for the most part to lofty hills, or rocky precipices[‡]; but the leaves of it are as carefully preserved, as those of the other sorts of ash. They hold in great esteem the maple,[§] which is well adapted to prop the vines; and is not more remarkable for the quickness of its growth, and rapid increase of its bulk, than for the uncommon size of its leaves. In short, there are very few deciduous trees, which do not administer food to cattle, and evergreens are not neglected; for, not to mention other sorts, I have often seen the peasants in the neighborhood of Naples take off all the leaves from the *ilex*. It is observable, that the leaves of the oak are less grateful to cattle in Italy, than those of any other trees whatsoever, upon account of their bitter taste and astringency; but when they are mixed with others, they are very well relished.

To preserve the freshness and verdure of the leaves, requires a great deal of attention. To effect this, they gather them about the end of September, or the beginning of October, at the time of the day when the heats are most piercing; and spread them very thin upon a pavement abroad, where they suffer them to lie three or four hours; after which they put them into wooden calks, and press them down as closely as possible; and cover them intirely with sand. The very moment after they have taken out the quantity which is wanted, they stop up the casks, lest the leaves should be exposed to the air; by which method they are enabled to keep them both fresh and tender during the whole winter. It is customary for the peasants in some parts of Italy to bury them in a pit, and to cover them with straw, upon which they lay either clay or sand; and both are equally calculated to answer the purpose. But there is a practice in the Veronese, which is deserving of particular notice. The husbandmen sink a very broad deep pit, and fill half of it with leaves; then they throw over them bunches of unripe grapes, about two feet thick: after which they put a layer of leaves of the same thickness; and then another layer of grapes alternately, till the pit is quite full, when they carefully protect it from the air. This not only prevents the leaves from heating, but impregnates them with a kind of spirit, which produces extraordinary effects; for the horned cattle eat them with a greediness which can hardly be conceived; and the sheep are as eager to devour them, as when they are first turned into clover in England. Upon the whole, it is certain, that there is no dry food in Italy, of which both horned cattle and sheep are so fond, as leaves well preserved; insomuch, that they fatten very quickly, when a sufficient quantity can be spared for them. In the good dairy farms in the Milanese, the cows are fed with hay in the winter, and are rarely suffered to touch any leaves, unless hay is extremely dear; but in other parts of Italy little regard is paid to the taste of the milk.

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[*] Fraxinus Florifera botryoides. Moris.

[†] Fraxinus Ornus Linn. Sp. plant. The common name in Italy is Orno, or Ornello.

[‡] Virgil has characterized the Orni with his usual propriety:

——— Steriles saxosis montibus Orni.—*Georg. ii. v. 111.*

[§] Acre majus folio rotundiore minus laciniato. The vulgar name is Oppio.

That the custom, which I have described, obtained among the ancient Romans, appears from the concurrent testimonies of the best authors. Cato the elder, recommends autumn as the proper season for gathering leaves; and directs the farmers to keep them as fresh as possible for their sheep[*]. Virgil has frequent allusion to this kind of fodder; and gives us undoubted reason to think, that the man who gathered the leaves was called by the name of *frondator*[†]:

> Hinc alta sub rupe canet *frondator* ad auras.
>
> *Ecl. i. v.* 57.

Horace takes it for granted, that his bailiff will feed his oxen with leaves, as soon as they are unyoked; an unerring proof, that the practice was very general.[‡]

> ——————et tamen urges
> Jampridem non tacta ligonibus arva, bovemque
> Disjunctum curas, et *strictis* frondibus exples.
>
> *Ep.* i. xiv. v. 27.

But of all the ancient writers, Columella is the most exact upon this head; for he has scarce omitted any thing that may serve to determine the quality and value of this kind of food; and, what is worthy of remark, he has enabled us to judge of the comparative goodness of of it; for it appears that twenty pecks of dried leaves were esteemed equal, in point of substance, to thirty pounds weight of hay.[§]

This branch of rural œconomics has been adopted in France from very early times. De Serres, who wrote under the auspices of Henry the fourth, speaks of it as an established custom; and affirms, that oxen did not prefer oats to leaves;[*] but instead of recommending the common method of gathering them, he advises the peasants to lop, in autumn, the boughs of such trees as are intended for fuel; and to keep them in a very dry place; so that the cattle might eat the tender twigs, as well as the leaves;[†] but there is no ground to imagine, that the advice of De Serres has been much followed. It is usual, at present, either to gather the leaves when they are upon the point of falling, or immediately after they are fallen; and to preserve them as dry as possible for the maintenance of their flock in the winter.[‡] The management of them seems to be best understood in some parts of Franche Compté and Auvergne. Whenever there is a very scorching summer, or an inconsiderable crop of hay, the peasants never fail to make an ample provision of leaves, which they keep in a barn, and frequently cover with straw, that they might not be exposed to the least moisture; but they do not gather them indifferently from almost all sorts of trees, after the manner of the Italians, but confine themselves chiefly to the beech, and to others of the same nature, whose leaves are not of a spongy quality.

We can trace this mode of husbandry in England as far back as the reign of Henry the eighth. Fitzherbert, who was judge of the court of Common Pleas, and father of English agriculture, advises the owners of underwoods to cut down no more at a time, than what was sufficient to support cattle for two days, being allowed to browze the tops, as well as the leaves.[§] This is partly upon the same principle recommended by De Serres. Many of the succeeding writers copied servilely after Fitzherbert, without adding any remarks upon this head; however, we learn from Mr. Evelyn, that, in the reign of Charles the second, it was customary to feed the cattle with the leaves of elms in some parts of Herefordshire;[||] and an author of unquestionable credit asserts, that these leaves gathered in August, and preserved with due care, will prove a great relief to cattle in winter when hay and fodder are dear; and he goes so far as to affirm that they will eat them in preference to oats, and thrive exceedingly.[¶] Whether this is practiced at this day in Herefordshire, or in other parts of England, I cannot take upon me to say: and whether it would be of general advantage to a country, where the price of labor is high, and where artificial grasses are carried to a great degree of perfection, I shall leave to others to determine.

I cannot conclude this paper without observing, that it is much to be regretted, that, our voyage-writers are not a little more conversant in agriculture and natural history; not only as it would prevent them from falling into mistakes, which are a discredit to themselves, but as it might render the remarks, which they have an opportunity of making, more curious and interesting to the public. Mr. Addison, speaking of the country between Verona and Padua, informs us, that "the fields are planted thick with rows of mulberries which furnish food for great quantities of silk-worms with their leaves; and that the trees themselves serve as so many stays for their vines, which hang all along like garlands from tree to tree."[*] One cannot account for so extraordinary an assertion, without supposing, either that he transcribed it from others; or that he was deceived by the appearance of the trees, in passing through that country in the midst of winter. There is no doubt, but that vines are supported by mulberries in several parts of Italy; especially in the state of Genoa, and in the Milanese; but these are straggling trees, and applied to that use, merely because they were found upon the spot, and other forest-trees had failed; and, I believe, it may be safely affirmed, that there was never a single plantation of mulberries trained in Italy regularly for this purpose. I have been asured by men of considerable age and experience, that the vines in the territories of Venice have been always supported by the elm, poplar, ash, or maple, as they are actually at this day; the practice of which was undoubtedly dictated by good sense; for, as the vines put out their leaves in general as early as the mulberries, and sometimes sooner, it would be impossible to take the first crop of leaves from the latter, without doing an injury to the former, whereas it is not usual to strip the forest-trees above-mentioned of their leaves, before the vintage commences; so that the vines can receive little or no damage. Mr. Addison observes, in the following paragraph, that "between the several ranges of vines there lie fields of corn, which, in these warm countries, ripens much better among the mulberry shades, than if it were exposed to the sun."[†] Had he consulted the ancient writers, for whom no one had ever a more exquisite relish, he would have found that they maintained the contrary opinion;[‡] and indeed it is obvious to every one, who has surveyed Italy with the least degree of attention, that, in the best corn countries, the grain is always sowed alone, and not encumbered with any sort of plants. This is the case of the plains in Apulia, and in the marc of Ancona: and it likewise prevails in the Valdichiani, which is properly called the granary of Tuscany, whether we consider the richness of the soil, or the superior mode of cultivation. It is farther observable, that an acre of land destined only for corn, is generally let for as high a price as an acre of land of the same quality which is planted, as well as sowed with corn; for, as the former is not exhausted by trees, and as the grain is brought to more perfect maturity by the heat, the increased value of the crop is supposed to compensate for the advantages which arise from the other kind of culture. This is a common covenant between landlords and tenants in the Venetian state, of which I have been an eye-witness myself. I shall mention but one more particular with respect to Mr. Addision, who says, that "there are at St. Remo many plantations of palm-trees, tho' they do not grow in other parts of Italy."[*] If we understand his words in their literal meaning, it must appear to be a groundless surmise; for many palms, or date trees, are to be found dispersed throughout Italy; and some of considerable age and size in the southern parts of the kingdom of Naples; but if he means, which indeed his words seem to insinuate, that they grow naturally only in the environs of St. Remo, he has certainly been led into an error; for they are not natives of any part of Italy. The only indigenous palm in that country, is what the botanists call *palma humilis*, and *chamærops humilis*, which seldom rises to more than five or six feet in height. It is to be seen all over Apulia and Calabria, where the peasants use it to make ropes, and baskets; and it is still more frequent in Sicily, where the lower people eat the roots, besides using the leaves for the purpose above mentioned. I observed it in the greatest abundance about the ruins of Selinus, which exhibit the remains of three of the most magnificient temples of antiquity; a circumstance, that fixes the meaning, and marks the propriety of the epithet, with which Virgil has distinguished this city.[†]

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[*] See chap vi. and xxxi. De Re Rustica.

[†] The commentators are strangely embarrassed about the meaning of the word *frondator*; but that it signifies the person who strips the leaves from the trees, is clear from a passage in Pliny, l. xxxviii. §. 74. "Unus *frondator* quatuor frondarias fiscinas complere in die justum habet."

[‡] Several commentators observe a profound silence with respect to the signification of *strictis*. Lambin interprets it stringendo succisis, which conveys no meaning. Cruquius says, "districtis, hoc est, diligenter pascis, ne desit agris colendis, strigosior factus." This seems to be equally unintelligible. *Strictæ frondes* are doubtless leaves gathered for fodder. Virgil uses the same expression where he represents the shepherd pointing to a grove or copse, in which it was usual for the husbandmen to strip off the leaves;

> ————————his, ubi densas
> Agricolæ *stringunt* frondes————
>
> *Ecl. ix.* 60.

Should any further doubt remain about the meaning of *strictis*, it is removed by Columella, who says, "possint etiam et folio ficulnea apte dari, si sit eorum copia, aut *stringere* arbores expediat." *L. vi. c.* 8.

[§] Si grano abstinemus, frondis aridæ corbis pabulatoria modiorum viginti sufficit, vel fœni pondo triginta. L. vi. c. 8. The Roman modius was rather more than our peck; and the Roman pound differed a little from ours; but the difference is inconsiderable, and it is not worth while to attend to niceties, when the design is only to convey a general idea.

[*] De Serres Theatre d' Agriult. ed. Genev. p. 260.

[†] Ibid. p. 714.

[‡] Du Hamel, Elemens d' Agricult. vol. 1762. p. 161.

[§] Ancient Tracts on the management of Landed-Property, 8vo. 1767.

[||] Evelyn's Silva, ed. 1776, p. 133.

[¶] See Lisle's Husbandry, ed. 1757, vol. 1. p. 298. Ellis says, that ivy gathered in the spring for ewes increases the milk, and that sheep love it exceedingly. See his Husbandry 8vo. 1772, vol. 2. p. 150.

Let it not be imagined, that my aim is to detract from Mr. Addison, whose works have not done more honor to our country, than to human nature itself. Such blemishes are to be overlooked in so accomplished a writer; but in those, who build their reputation entirely upon books of travels, they are not so easily pardonable. It is a common remark, that it is impossible to make any fresh discovery upon so beaten a track as Italy. Perhaps it may be true, as to painting, sculpture, and architecture, which swell the volumes of so many authors, at the expense of inquiries more useful and important. The "suspendit picta vultum mentemque tabella," (to use the beautiful expressions of Horace) may be proper to form the taste; but when that is formed, the mind ought to employ itself in more rational researches; and the fine arts should be esteemed but as secondary pursuits. It must, however, be acknowledged, that new sources of information have been opened in the present age, which, either through the ignorance or prudence of earlier voyage-writers, had been suffered to lie unexplored. The most secret transactions of families have been pryed into, and reported as clear and undoubted truths: the gallantries of the first nobility have been proclaimed: the conversation of crowned heads has been retailed: and the confidential communications of individuals have been disclosed, whose fortunes, and even lives might be endangered by an ill-judged attempt to amuse the public. But there is still to be found an ample body of materials which have scarcely been touched upon by others; and which may possibly furnish instruction, if not entertainment. Such are a description of several parts of Italy, which lie out of the general tour of travellers—an examination of the state of literature—a view of the internal commerce—an inquiry into the different kinds of cultivation—and a comparison of the ancient and modern husbandry, as far as it can be ascertained by observations upon changes either in the soil or the climate, or the introduction of plants unknown to the old Romans. I am unable to judge, whether disquisitions of this sort would be acceptable to the public; but were I persuaded, that they would be not unfavorably received, I would gladly concur in forwarding the plan of my excellent friend and neighbor, Mr. Young; and would not confine myself to the practical part of Italian agriculture, but endeavour to explain both the physical and moral causes which tend, in any degree, to facilitate or obstruct it.

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[*] Vol. 11. p. 21. London 1721, 4to.

[†] Ibid. p. 22.

[‡] It is sufficient to quote the authority of Columella, who says expressly, "Omne autem frumentum maximè campo patente, et ad solem prono apricoque et soluto lætatur. Lib. ii. c. 9.

[*] Ibid. p. 8.

[†] Teque datis linquo ventis, *palmosa* Selinus.
Æn. iii. v. 705.

J. S.

EMPLOYMENT OF MINERAL TAR, OR PYROLIGNEOUS LIQUOR, FOR THE PROTECTION OF WALLS OF MASONRY OR OF MUD.

When the walls are thoroughly dry, towards the end of summer (having previously been either newly built or put into a state of thorough repair), they are to be coated over, once, twice, or thrice, with the tar. The last coat, immediately when put on, may be powdered with sand; and this, when solidified, may be whitewashed. In France, earthen walls, and the walls of court-yards and terraces, are treated in this manner and so rendered of great durability. (*Annales des Ponts et Chaussèes,* as quoted in the *Frank. Jour.*, vol. xxii. p. 281.)

PRESERVING SPECIMENS OF PLANTS, OR OF ORGANIC SUBSTANCES GENERALLY.

Dr. Riddell of Louisiana has found that by wholly extracting the moisture from the specimens to be preserved, which he does by means of unslacked lime, and then enclosing them in hermetically sealed cases, they may be exposed to the light without in the slightest degree losing their color. By carefully surrounding fresh specimens of Ròsa gàllica with fine powder of quicklime, in a close tin box, complete desiccation was accomplished in a single day; and the flowers, when taken out, were found of their natural shape and color; but stiff and brittle from dryness. The rose, or other flower or plant, insect, &c., so dried, is next put into a case (like a wax flower), with a pane of glass in front, and the whole closed by means of putty so as to perfectly air-tight. Specimens of insects, fungi, fruits, &c., are effectually embalmed in this manner, but the most practically important part of the discovery to the botanist is, that cacti, and other succulents, may be perfectly dried in a few days, and afterwards deposited in cases with glass fronts, with their form and color perfectly preserved. The details at length are given in *Silliman's Journal*, vol. xxxv. p. 330. —*Cond.*

KYANISING WOOD.

Kyanising wood for plant labels, stakes, and various other garden purposes, has been tried during the last three years by Mr. Masters, at Canterbury. Various kinds of wood were subjected to the process, from the Lombardy poplar to the oak, and both in a green and seasoned state; and the general result was, that the process hardened and rendered more durable the interior surface of all woods, green or seasoned; but that, at the same time, it rendered the stakes and tallies more brittle, and consequently more easily broken over by the surface of the ground. In consequence of of case-hardening the outer surface, the Kyanised wood is rendered more durable, and exterior decay prevented or retarded; though, of course, decay, or dry rot, or wet rot, may go on in the heart of the wood as much as if the outer surface had never been Kyanised. In no kind of wood, green or seasoned, does the liquid penetrate farther than from an eighth to half an inch. Mr. Masters has kindly promised us the details of his experiments on this subject. In the meantime we subjoin a quotation from Barrow's *Life of Lord Anson*, in the opinion expressed in which, our readers who have tried, or think of trying, the process, will feel interested.—*Cond.*

Kyanising.—"It is to be hoped that we shall have no more tampering with dry-rot doctors and their nostrums for the preservation of Her Majesty's ships. The steeping of large logs of timber in solutions of any kind *is perfectly useless:* the solution penetrates only skin deep, whereas the real dry rot commences at the centre where the fibres, being the oldest, first give way, as is the case in standing trees. The only plausible and promising preservative of timber is the gas of the kreosote procured from the distillation of coal or vegetable tar, which, when driven off in the shape of gas, will penetrate every part of the largest logs, and render the wood almost as hard as iron; so hard, indeed, as not easily to be worked. It is understood that, in Belgium, they are using it as blocks for the railroads. The worm, (*teredo navalis*), as proved at Sheerness, will not touch it; while pieces of the same wood, *steeped in corrosive sublimate, sulphureous acid, and other active solutions* were bored through and through. Let our ships be built of good sound English oak, as they formerly were, well seasoned under cover, and left on the stocks as long as they conveniently can be allowed, and we shall hear no more of dry rot, or wet either. (*Sir John Barrow's Life of Lord Anson,* as quoted in the *Mech. Mag.*, vol. xxx. p. 336.)

AGRICULTURAL PERIODICALS IN THE UNITED STATES.

From the Genesee Farmer.

Twenty years since there was but a single periodical in this country devoted to the great interests of agriculture; and though much talent and ability was displayed by the conductor, it barely existed through some two or three of its first years. This paper was the 'American Farmer,' published by J. S. Skinner, Esq. at Baltimore. In a country where ten-twelfths of the inhabitants were farmers—a country that supported some 5 or 600 political papers—the propriety of a single agricultural journal, was by many considered problematical. The experiment succeeded, however, and the utility of the paper was so obvious, and its benefit to the community so great, that it was soon placed on a firm basis. After issuing some 17 or 18 years it was discontinued, or rather issued under a new name. After the 'American Farmer,' was established firmly, the 'Plough Boy,' was commenced at Albany, by S. Southwick, esq. and was the means of diffusing much valuable information, and exciting inquiry and emulation among farmers. From some cause the 'Plough Boy' did not receive the encouragement such a work required, and after a publication for a few years was finally discontinued. Another journal, well conducted and rendering the cause of agriculture much service, was established in 1828, at New York, by S. Fleet, Esq. which was discontinued only some two years since, in consequence of the losses sustained by the publisher in the great fire of New York in 1836. This journal was the 'New York Farmer.' We have mentioned these pioneer journals, not only because they were the first, or among the first in time in this country, but because they did much towards convincing agriculturists that the system of cultivating the soil in this country was miserably deficient, that great improvements might be made in the preparation of implements, in the management of manures, and in the general order of a farm; and none were so perfect in the business as not to be capable of being instructed. They convinced many that agriculture was of itself one of the noblest of sciences, that knowledge was essential to its successful pursuits, and that no man was born a farmer any more than a lawyer, physician or divine.

In giving a catalogue of existing agricultural periodicals in this country, we shall, so far as we are able, notice them according to the time they have been published, merely stating that the number we have before us, admonishes us that we must be brief in our estimate of their character and merit, where time has admitted of development in these respects.

The 'New England Farmer,' is the oldest of our existing agricultural publications. It has reached its seventeenth volume; and bids fair we think to run a long career of usefulness. Mr. Fessenden was its former able conductor. On his death, it came under the supervision of the talented commissioner of agriculture for Massachusetts, the Rev. Henry Colman, and the great advantage he enjoys in virtue of his office, are made subservient to the general diffusion of sound agricultural knowledge through the Farmer, as well as his annual reports. The N. E. Farmer is published in the quarto form, weekly, at $2 50 per annum.

The 'Southern Agriculturist,' is the next on our list, the first number of the twelfth volume being now before us. It is published at Charleston, S. C., editor, B. R. Carroll, in monthly numbers of about 50 pages, at $5 00 per annum. It is well conducted, but principally devoted to the culture of southern productions, as cotton, rice, sugar, &c. and affords many interesting examples of the amount and profits of slave labor, compared with that of the free cultivator of the soil.

Our own paper, the 'Genesee Farmer,' is next. The Weekly Farmer has reached the ninth volume, and the Monthly Farmer the fourth. Both are in the quarto form, the first containing 8 and the last 16 pages each number. Weekly, $2 00, Monthly, 50 cents per annum. Of its character and merits we shall be excused from speaking, any further than to say, that it is intended for circulation through our *whole country;* that we design it shall at least equal, in practical utility, any similar publication in the United States; and that a most rapidly increasing circulation, convinces us that our exertions are not unappreciated by our farming brethren.

The 'Farmers' Register,' published at Petersburg, Va. is a monthly periodical of 64 pages, at $5 00 per annum; editor, Edmund Ruffin. The Register stands deservedly in the front rank of American agricultural papers. The industry of the editior, his sound practical views, his acquaintance with the principles that govern vegetation, as developed in his valuable 'Essay on Lime' as a manure, and his freedom of all cant and humbug, have united to give the Register a deservedly high character, which we trust it will long sustain. Such periodicals, while they contribute to the knowledge, elevate the profession of the farmer, and do much towards placing him in the commanding position to which the paramount utility of his avocation entitles him. The Register has reached its seventh volume.

The 'Maine Farmer,' is a valuable journal, published at Winthrop in Maine, by Mr. Holmes, weekly, quarto, at $2 00 per annum. It has entered upon its seventh volume. In one respect the 'Maine Farmer,' differs from any agricultural paper with which we are acquainted. It has a legal department, devoted to the discussion of such questions as are apt to arise among farmers, and which may be exceedingly useful in preventing expensive lawsuits among neighbors.

The 'Farmer and Gardener,' of Baltimore, edited by E. P. Roberts, is the worthy successor of the 'American Farmer,' which we have mentioned as the earliest agricultural periodical in the United States. It is weekly quarto, and furnished at $2 50 per annum. No paper in the country has done more for the silk cause than the Farmer, and few understand the matter in all its bearings than the able editor of that journal. The Farmer has also taken a lively interest in the production of improved cattle and sheep; and in this way has rendered essential aid to the cause of agriculture.

The 'Yankee Farmer,' Portland, Maine, weekly, quarto, S. W. Cole, editor, now in its the fifth volume, $2 a year.

The 'Ohio Farmer,' S. Medary, editor, is the name of a quarto semi-monthly journal, published at Columbus, Ohio, $1 00 per annum. It has, like the preceding, reached the fifth volume. This journal has given many valuable original papers on subjects connected with farming and horticulture, and has evidently exerted a most favorable influence on the agriculture of the vicinity.

The 'Magazine of Horticulture and Botany,' is a Boston monthly publication, edited by C. M. Hovey, of which the object is sufficiently indicated by the title. It is eminently useful to the florist and gardener, and contains engravings occasionally of rare and curious plants. The terms are $3 00 per annum; 40 pages in a number.

The 'Albany Cultivator,' conducted by Jesse Buel, has just entered upon its fifth year, under flattering auspices. It is published monthly, 16 pages quarto, at $1 00 ber annum. The well known talent and industry of the editor, and his rare combination of scientific and practical knowledge in matters relating to agriculture, have given the Cultivator a high character and standing among agricultural periodicals. Its circulation is extensive.

The 'Franklin Farmer,' published at Frankfort, Ky., by F. D. Pettit, weekly, quarto, at $2 00 per annum, is one of the most spirited and ably conducted journals west of the Allegany mountains. In every thing relating to the improvement of cattle and swine, it is without a rival, and on the general topics of agriculture it has done much to introduce a more scientific and rational system into that state. It is now in its second volume.

The 'Farmer's Cabinet,' is published monthly at Philadelphia, by J. Libby, in numbers of 32 pages octavo, at $1 00 per annum. It is an excellent work, has an able corps of contributors, and a good circulation. A part of Pennsylvania furnishes some of the best specimens of farming in the United States; and the diffusion of such works as the Cabinet among an industrious population will have a tendency to greatly increase the number of such examples.

The 'Indiana Farmer,' is published weekly at Indianapolis, at $2 50 per annum, quarto, by Osborn & Willets; and though not exclusively devoted to agriculture, has exerted a favorable influence on the farming community of that flourishing state.

The 'Tennessee Farmer,' Jonesbaro,' 16 pages octavo, monthly, at $1 per annum, J. F. Deaderick, editor. This is the first agricultural paper issued in Tennessee, and is now in its third volume.

The 'Rural Repository,' is a monthly reprint of agricultural works of standard merit, ("entire, compiled, abridged and original.") It is published at New York, 40 large octavo pages monthly, by S. Fleet, former editor of the 'New York Farmer.' The talents of the editor, and the ample field before him for selection, gives the promise of an excellent work; and the numbers already before the public, (the second volume is entered upon) show that any reasonable expectations will not be disappointed.

The 'Silk Culturist,' the first and a very valuable publication on that subject,—*was* published at Hartford, (Conn.) for three years—and we believe it is still continued at Wetherfield, though we have not seen it for the last year.

The 'Practical Farmer,' Mechanicsburg, Pa., a monthly quarto of 8 pages, at $1 a year.

'American Turf Register and Sporting Magazine.' This magazine has entered on its tenth volume, and has been transferred from Baltimore to New York, and is now under the supervision of T. O. Porter, Esq. of the 'Spirit of the Times;' monthly octavo, $5 a year.

None of the following publications have completed their first volume and many of them have but just appeared. To express a definite opinon respecting such, would in most cases be a premature act; but some of them come forward under such auspices as to lead to high expectations from their circulation among the agricultural community.

The 'Miami Farmer,' quarto, semi-monthly, $1 00 per annum, published by W. Appleton, Xenia, Ohio, No. 2, vol. I.

'Southern Cultivator,' Columbia, Tennessee, large quarto, semi-monthly, $2 00 per annum, David Clayton publisher. A respectable paper we think, and devoted to agriculture and the kindred sciences. Vol. 1. No. 7.

'Western Farmer,' Franklin, Tennessee, monthly, quarto, (4 pages) F. Moore, editor, $1 00 per annum. Vol. 1. No. 7.

The 'Cumberland Farmer,' Gallatin, Tenn., monthly at $1 a year. Vol. I, No. 6. J. A. Browning & Co. publishers.

'Farmers' Monthly Visitor,' Concord, New-Hampshire, Hon. Isaac Hill, editor, quarto, 16 pages, well got up, and published at 75 cents per annum. This monthly paper we are led to believe is destined to take a high rank among agricultural periodicals; and we think it speaks well for the cause of the farmer, when men who have attained to some of the highest offices in the gift of the people, are willing to devote their talents and the information they must have acquired, to the diffusion of agricultural knowledge. Gov. Hill's 'Monthly Visitor,' we predict, will be a welcome guest with thousands of our farmers.

'Wisconsin Culturist,' Milwaukee, Wisconsin territory, semi-monthly, quarto, $1 00 per annum. W. P. Proudfit, editor.

The 'National Silk Worm,' quarto, (4 pages) Philadelphia, price $1 00. Thomas C. Clark, editor.

'Cheshire Farmer,' Keene, New Hampshire, quarto, monthly, 50 cents annually, B. Cooke, editor. A good little paper and worthy of patronage.

'Michigan Agriculturist,' Detroit, H. H. Snelling, editor, quarto, weekly, price $2 00 per annum. It is a valuable paper, and should receive an ample support from the farmers of that young but flourishing state.

The 'Maine Cultivator,' 4 pages quarto, Hallowell, W. A. Drew, editor, $1 a year. It is edited with much ability, and the only drawback with which we hail its appearance, arises from the circumstance that Maine already possesses two excellent agricultural papers, and we fear that there is not room for a third.

The 'Farmer's Advocate,' Jamestown, North Carolina, octavo, 16 pages, semi-monthly, $1 25 per annum, John Sherwood, editor. Mr. Sherwood deserves credit for getting up an agricultural paper in that section of the United States, and the information his work diffuses will not be without its effect on the agriculture of the state.

'Boston Cultivator,' Boston; vol. 1, No. 15; weekly, folio, $2 00 per annum, Wm. Buckminster, editor. This we doubt not will be a valuable paper, though we are unable to perceive the particular necessity for another agricultural paper in that city, where the ground has been so long and ably occupied by the 'New England Farmer.' The numbers already issued evince agricultural skill, and a proper spirit of enterprise. There is a little leaning, however, to the belligerent, which should, we think, be eschewed, as out of place in such a journal.

The 'American Silk Grower,' octavo, (16 pages) Burlington, N. J., Cheney & Brothers, editors, monthly, $1 00. This is one of the best publications devoted to the silk culture in the United States; embracing a great variety of practical articles, the result of experience in this country. It is got up also in very good style, and must be useful to all who are entering upon the culture of silk.

'Journal of the American Silk Society,' Baltimore, monthly, 40 pages octavo, $2 00 per annum, J. S. Skinner, editor. This is a work of authority, published under the direction and patronage of the American Silk Society, and well edited, if the three numbers issued may serve as a specimen. There can be no doubt that the silk culture must succeed in this country, but whether societies will advance it more effectually than individual enterprise remains to be seen. Such publications cannot, however, be otherwise than useful, as directing labor into proper channels, and thus preventing mistakes and disappointment in the outset.

We have thus briefly noticed our agricultural periodicals, and if we have omitted any, will endeavor to give them a place another time. The list amounts to 32, and nearly one-half of the whole are still in their first year. There are probably 1,500,000 families in the United States that are devoted to agriculture, and that each of these should take a paper designed to support their interests cannot well be denied. There would seem then to be room for as many, or even more papers such as we have noticed, than are now issued; but that even all these can succeed, is to say the least, problematical. It may be doubted whether all the above papers circulate more than 100,000 copies, and of these three-fourths of the whole are issued by some five or six of the journals. A paper devoted to agriculture, to the arts or sciences, or even to literature, occupies very different ground from a political journal; and it by no means follows that, because every county supports one or two of the latter, that the same will be done by the former. To render the first what they should be, requires the combined labors and observations of a large circle of individuals; men of scientific resources, and men of practical skill; acquainted with the modes of agricultural or mechanical manipulation, as well as the theories on which their business is based; and their labors and efforts directed to produce a common result. To multiply journals of any kind beyond the means of adequate remuneration, is to lessen the incentives to emulation and excellence; and we cannot but think that if in some cases of newly established journals, the material furnished them had been poured into some of the already existing channels of communication with the farming community, it would have been well for both. While we cordially welcome every new laborer to the agricultural field, we feel bound to state that in order to make an agricultural journal useful, difficulties and labors of which the uninitiated are incompetent to judge, will, in all probability, be encountered, before the success, which we trust is in store for them, will be effectually secured.

COST OF BREEDING HORSES OF RACING STOCK.

[Extract from the Turf Register.]

The prices at which stallions cover are too high —out of all proportion to the chances of profit. A breeder will inevitably incur an expense of $225 to send a mare from here (Green county, Ala.) to Leviathan, let her stay through the whole season, and get her home. And it is very possible that the colt he gets, if he gets one at all, will not be worth that money when 3 years old. Now this, perhaps, may be denied, and much said about good mares, blood, form, &c. &c. Look at the facts.

I sent two mares to this famed Leviathan; they were good mares—mares raised in Tennessee and priced at $800 each, and this high price said to be low, when the blood, size, and form possessed by them, were considered. The travelling expenses there, and back, were $75 each; for the season, and their keep whilst with him, I paid about $280, besides the worth of a boy six months, who staid with them. I got two colts; one died at a few days old—the other is now 4 years old this spring, and worth perhaps $100!

This is meant as much for every other high priced stallion as for Leviathan; for the thing is general. The expense, in my opinion, overruns the chances of profit. You gentlemen who publish sporting periodicals, are furnished with the sales of high priced nags, but hear nothing of the hundreds of failures, in the attempts to raise blood stock. Let some one competent, take one hundred, or one thousand mares, of unexceptionable pedigree and good form, put to high priced stallions, and report correctly the proportion of profit and loss thereby accruing, and in my humble opinion it will put another face upon the matter. It is too much of a lottery business; and tickets or chances cost too much in proportion to the number of blanks.

I love the blooded horse—am intensely fond of the sports of the turf, and no man would be more willing to see owners of stallions well patronized and well paid, than myself; but whilst we pay them liberally, let us not encourage them to impose on breeders, from whom their support is derived.

These crude reflections I wish some one more capable than myself to enlarge upon, and throw just as much light on the subject, as will let breeders generally see and appreciate the chances of getting a $1000 or $5000 colt, with the chances also of breeding one that will never repay expenses.

D. M. G.

EXTRAORDINARY SALE OF HEREFORD CATTLE.

From the British Farmers' Magazine.

Sir—I was formerly an occasional contributor to your periodical, and was at all times a well-wisher to its success. Being now resident in Herefordshire, I am afforded many opportunities of seeing the fine breed of cattle the county is celebrated for; and I have, within these few days, been present at a sale which I think you will have a satisfaction in recording in your pages, as it has not been equalled in the prices produced since the celebrated one of the Miss Tompkins' in 1818, at which a bull and cow nearly reached £900.

The stock of cattle just sold was the property of J. D. Kedward, esq., of Westhide, who has not been many years a breeder, and is now giving up farming, but having made judicious selections, has raised a herd which has gained extensive notoriety. Their distinguishing characteristics are capacious frames, deep flesh, with great aptitude to fatten; their color red, with white faces, which was the most prevailing color of the county breed for a considerable length of time previous to the last twenty years, since which spotted faces have been most sought after, chiefly, perhaps, from their having been predominant in the stock of that eminent improver of the Hereford breed, the late Mr. Benjamin Tomkins. There has, however, lately been propagated a notion, that the largest frames accompany the former color, and it has consequently become more in vogue again. How far such a notion is well founded, the production of the most valuable oxen will best determine.

Mr. Kedward's herd (the whole of which were sold in the most reserved and honorable manner) amounted to 74 head, which averaged—including 21 young calves which were sold separately from the cows—about £26; the cows and heifers averaging a little more than £30. Three cows, with calves, averaged £80, and a bull calf, ten months old, £80. The company was very numerous and respectable, and the arrangement admirable. The principal part of the stock was bought, too, by county men. I am, sir, yours, &c.

E. F. WELLES.

Hereford, February 10, 1839.

EXTRACTS FROM THE PROCEEDINGS OF "CHUCKATUCK AGRICULTURAL CLUB."

Communicated for the Farmers' Register.

In pursuance of adjournment the "club" met on Wednesday 9th day of January, A. D. 1839, at the Masonic Hall in Chuckatuck, at 10 o'clock A. M.

Dr. Crawley Finney, the president, took the chair, and called the meeting to order.

Mr. Day, chairman of the committee to correspond with breeders of improved stock, &c., and reported that the committee had discharged that duty and proceeded to read a letter from Caleb N. Bement, esq. of Albany, New York, on the the subject, which was ordered to be filed.

Mr. Harrell, offered the following preamble and resolutions.

Believing that competition in agricultural, as well as in the other pursuits of life, is highly conducive to both improvement and profit, and with the view to the attainment, of those two valuable objects—

1st. *Be it Resolved*, That as many of the members of this society as conveniently can, will select from their *best* lands any number of acres, from one to ten, and cultivate the same the present year in corn, each party, to select his own kind of seed, and to manure and cultivate his land in any mode that he may think best, so as to make the largest crop, that the land cultivated may be capable of producing; each crop, when ripe, to be accurately measured; and the quantity made, kind of seed used, and the particular mode and manner of manuring and cultivating, and the expense of the manure, all reported to the regular meeting of this society, in November next.

2nd. *Resolved*, That in order to ascertain the difference between the production of our richest lands when highly manured and cultivated, and our *poorest* when similarly manured and cultivated—each member of this society who shall enter the lists of competition under the above resolution, will also take a like number of acres of his *poorest* land and manure and cultivate the same in like manner as the first, and make a like report to this society, at its regular meeting in November next.

3rd. *Resolved*, That as many of the members of this society as conveniently can, will cultivate the present year, any number of acres of land (but not less than a quarter of an acre) in ruta baga turnips—the land to be manured and prepared, and the seed to be sown either broadcast or in drills, at the option of each party—the crop when ripe to be judged or measured, and the quantity made, mode and manner of cultivation, and manuring all reported to this society, at its meeting in November next.

The preamble and resolutions were then successively adopted by the meeting.

On motion of Mr.———it was *resolved*, That it is the opinion of this society, that industry, enterprise and skill, are eminently essential to the attainment of great success in almost every undertaking in life—and particularly in the great business of agriculture—on the prosperity of which mainly depends the success of almost every other occupation. Therefore,

Resolved further, that the members of this society will give increased attention and diligence to the improvement of their lands and stock, the developements of science, and to any and every thing that may have a tendency to advance their interest in a pecuniary, moral and social point of view.

Mr.———offered the following resolution:

Resolved, That a committee of five be appointed, whose duty it shall be *forthwith* to memorialize the general assembly of Virginia on the subject of agriculture, and to ask such aid and assistance in behalf of the same, as to the wisdom of the assembly may seem just and due to the great and paramount (though neglected) interest of the state. This resolutoin was unanimously adopted; and Doct. John French, John Crocker, John C. Crump, Dr. Crawley Finney, and Robert Lawrence, esqs., appointed the committee to carry the same into immediate execution.

The meeting then adjourned—

On Thursday, the 11th day of March, its regular day, the club met again and fixed on the following premiums for the present year, to be awarded at the regular meeting in November next, to wit: For the best crop in the aggregate, twenty dollars; for the best pen of hogs to be raised the present year, ten dollars; the best milch cow and calf, five dollars; the best yoke of oxen, five dollars; and for the cheapest and best constructed manure cart, five dollars.

CRAWLEY FINNEY, *Pres't*.

JOSHUA M. HARRELL, *Sec'y*.

May 4th, 1839.

MEMORIAL TO THE LEGISLATURE.

Your memorialists have been charged with the duty by the "Chuckatuck Agricultural Club" of Nansemond county, of presenting to your honorable body a petition, soliciting your attention to the great and paramount interest of agriculture.

In the discharge of this duty, your memorialists beg leave to express a decided conviction that it is essential to the best interest of the state that speedy and efficient measures be adopted to elicit and encourage efforts to improve and fertilize the soil of the state. In the judgment of your memorialists it can scarcely fail to excite astonishment, that whilst nearly every other interest of the state has been made the subject of frequent and exciting discussion, of bold and energetic legislative enactments, and of large expenditures of the common treasure, it has hitherto been well nigh impossible to attract to agriculture, the great source of wealth and power to all communities, that attention which could induce the legislature to pass any laws, or to appropriate any money, having essentially and directly in view the advancement of its interest. Your memorialists cannot understand the advantage or propriety of intersecting an impoverished and steril country with canals and rail-roads, nor can they perceive the wisdom of aiming to draw to the bosom of the commonwealth the abundant productions of distant, and as yet, virgin soils, to the neglect of our own agricultural resources. The soil of Virginia, once rich and bounteous in its productions, though now fearfully deteriorated, is capable, in the judgment of your memorialists, of rapid and profitable renovation.

To the minds of your memorialists all the motives arising from patriotism, love and veneration for native soil, and of interest, urge to the adoption of every measure calculated to effect this great object.

Your memorialists will not presume to dictate to your honorable body the measures to be adopted to accomplish the object they have in view, but will venture to suggest that, inasmuch as all scientific and practical improvements in agriculture contribute to the public benefit, it justly becomes the subject of legislative enactments, and a portion of the public treasure may justly be appropriated for its encouragement; a measure, which, if successful, would add to the wealth and resources of the state, give increased value to all her public improvements, by adding greatly to the transportation of produce and of travel, increase her population, and add most essentially to the value of her lands, and what is of still more importance, destroy the spirit and practice of emigration, cannot be deemed an unfit subject of legislation. The power and wealth of the state directed by your honorable body may speedily effect improvements which the insulated efforts of individuals may in vain endeavor to accomplish. Believing in the correctness and importance of these views, your memorialists would earnestly solicit from your honorable body that attention which the subject justly claims.

John French,
John Crocker,
John C. Crump,
Crawley Finney,
Robt. Lawrence,
Committee.

THE COCOONERY—FIXTURES—FEEDING SILK-WORMS, &c.

By Gideon B. Smith.

From the Journal of the American Silk Society.

It is a common remark that silk-worms require no particular building or fixtures, and nothing but the most ordinary attention; that they do as well in *barns* and *open sheds* as any where else; and that wet weather and damp night air do them no injury. It is readily admitted, that silk-worms may be raised in this way, and that good silk and a tolerable profit may result from it. But when those who preach such doctrine as the above shall have had a few years experience, they will concur with the writer of these essays in saying, that, though barns and sheds will do tolerably well, properly constructed cocooneries will do much better; for, though the former will yield a small profit, the latter only can be depended upon for a satisfactory result at all times and under all circumstances. All will admit, that *some* corn can be produced from ground badly ploughed, poorly tilled, and subject to depredation from cattle for want of a good fence; but surely that would be a poor argument with good farmers against a higher grade of cultivation and attention; they will know, that, though the soil will do much, it is from their care and industry that the main profit of the crop is to be derived. With silk culturists, care and attention, with proper cocooneries and fixtures, are all important. The writer has several times proved, that, with close attention the worms can be made to spin their cocoons in twenty-five days; whereas ordinarily they require *forty-two days;* and that of the cocoon, produced in twenty-five to twenty-eight days, only eight pounds were required to make a pound of raw silk; while it took ten pounds of those produced in forty-two days; and further, it required one-eighth more raw silk from the latter to make a pound of finished silk that it did of the former. These are practical facts which every one's experience will demonstrate that tries the experiment. It is a curious circumstance, and we will try to reduce it to figures, to show the difference in parallel columns:

100,000 worms, 42 days, cocoons 300 to the pound, 333 lbs. cocoons, 33 lbs. raw silk, at $5 00,	$165 00	100,000 worms, 28 days, cocoons 240 to the pound, 416 lbs. cocoons will make 52 lbs. raw silk, at $5 00,	$260 00
Cost of labor, leaves, &c. six weeks, say	100 00	Cost of labor, leaves, &c. four weeks,	67 00
Profit,	65 00	Profit,	193 00
33 lbs. of this raw silk will make 24 lbs. finished silk worth $8 00,	$192 00	By the other system,	65 00
		Difference,	$128 00
		52 lbs. of this raw silk will make 42 lbs. finished silk, at $8 00,	$336 00
		By the other system,	192 00
		Difference, .	$144 00

The above estimates are, it is believed, strictly correct. If they vary from the results of actual practice, it is believed to be in favor of the negligent system rather than against it. But is said they raise silk-worms and make silk in the cabins of the peasantry of France and Italy, every little family keeping them in their small cabins, in the midst of their children &c. and hence an argument is drawn in favor of negligence. We should scarcely deem it necessary to waste time in refuting such argument, were it not for the mistaken notion so generally prevalent, that in France and Italy the silk business is *universal,* has arrived at perfection, and that whatever is done there by the people at large must be right; when the fact is, that there is as much effort now making in those countries to improve the system of silk culture as there is here. There are numerous periodicals published there, devoted to the improvement of the silk culture; not only to the improvement, but to the *introduction of it in those countries generally.* This will no doubt surprise many of our countrymen, but is not the less true. The French periodicals are laboring hard to introduce it into France generally. They even publish *diaries* of the work (such as that in the third number of the Journal*) to show to the people that they can make silk there, to teach them how to do it, and the profit of the culture. The truth is, that in the larger portion of the south of Europe, the silk business is as new as it is here; and even in those districts where it is cultivated, the systems of culture are generally of the rudest character. Hence the efforts of public men there to improve the business. They recommend by precept and example, cocooneries and fixtures constructed expressly for the business; and lay down in the most minute manner, rules for the management of the worms from day to day. It will, therefore, be well for us, as beginners and learners, to commence right, and to practise the art in the best possible manner; to begin, indeed, at the highest grade to which the Europeans have arrived, and to improve even upon that.

Cocooneries.—In the construction of cocooneries, regard should be had to convenience of form and eligibility of the site. A long low building is more convenient than one several stories high; and a high airy situation is preferable to a low one. A building intended to accommodate 1,000,000 of worms, must be eighty feet long by forty feet in width, one story high; or in that proportion. I think a better form would be one hundred feet long by thirty-two in width, which would afford the same room. A plain frame building is best. It should be weather-boarded, and instead of laths and plaister, the walls should be tightly boarded also. There should be windows every six or eight feet on each side, with shutters; and ventilators along the sides near the floor, and under each row of hurdles, and also in the ceiling, to admit of a free circulation of air when necessary; and so arranged with shutters that they may be closed at pleasure. The building should be raised three or four feet from the ground, on pillars, to insure its freedom from damp, and to admit the passage of pure air from below. This also renders it more inaccessible to rats and mice, which are very destructive to silk-worms. It will be a great advantage if the building have an upper story or half story, as it will protect the cocoonery in the lower story from the heat of the sun, and will be very useful as a store room for cocoons, and many other uses. Where there are high trees to shade the roof, they will be found of great benefit; but they should be trimmed of their branches as high as the top of the building, to guard against dampness, and to secure a free circulation of air around the building. Fire places should be provided in each side and end of the cocoonery, for the purpose of drying the atmosphere in damp weather. Or, what is still better, air furnaces may be provided in small cellars under each end of the cocoonery, for this purpose.

The fixtures for a cocoonery are properly constructed hurdles or shelves on which to feed the worms. There are, probably, no two cocooneries in existence alike in this respect. Some have nothing but simple board shelves, six to eight feet long, supported upon cleets at each end; and made to draw out and in at pleasure. Others have frames of the same dimensions, with net-work bottoms, and provided with sliding shelves two or three inches below to catch the ordure that falls from them. I have preferred the latter to simple boards; but Mr. Whitmarsh, who has for many years fed worms extensively, and who at first used net-work hurdles, prefers the simple boards, and now uses them altogether. Of course there can be but little, if any advantage in the former, or he would not have abandoned them; and there must be some advantage in the latter, to autherize his laying aside the net-work and resorting to the board shelves in his extensive establishment.

Hurdles.—The net-work hurdles may be made most cheaply in the following manner: The frames are formed like the outside frames of a window sash, of seasoned pine or poplar stuff, an inch thick, and about two inches wide. Mark off the sides and ends on the upper surface with compasses, three-fourths of an inch apart, and place half-inch tacks with heads in the marks, driven nearly to the head. Then take a ball of doubled and twisted cotton twine, tie the end to the first tack on one corner, and pass it to the other side, around the heads of two of the tacks next to the opposite corner, drawing tightly, and return to the second tack on the first, passing round the head of that and the next, and returning to the third and fourth tacks on the other side, and so on till all the tacks are occupied, and driving down the tacks so that they will confine the twine. Then turn the hurdle the other way, and fasten the end of the twine to the first tack in the corner and pass the double twine alternately over and under two of the cross threads to the other side, passing the loop over two tacks drawing them tightly and driving down the tacks; thus continuing till the whole hurdle is finished. The meshes will thus be three-quarters of an inch square. I have made them by perforating the frames with a brad-awl; and others make them by sawing the frames across at the proper distances, about a quarter of an inch deep and passing the twine through the track made by the saw. I think those made with tacks much the simplest, and as good as any other. Messrs. Jenks and Ramsburg of Frederick make them in that way. A couple of men can make twenty to thirty in a day. Others make regular netting, and stretch it over the corners of the frames, and confine it to them with cords. The size of these hurdles depends upon the fancy of those who make them. They are generally four to six feet long, and two to three feet wide. I think two and a half feet by four, the most convenient size.

Standing posts.—To support the hurdles, upright posts are required from the floor to the ceiling, just far enough apart, lengthwise, to admit the hurdles between them. If the hurdles are five feet long and two and a half wide, then the posts should be five feet apart in the clear, lengthwise, and two feet apart the other way. Cleets nailed across these posts, one foot apart, beginning one foot from the floor, serve to support the hurdles, which may be drawn out and in like a drawer. The posts may be made from three-inch joists. For small establishments, or when the room is required for other purposes after the silkworms have done with it, moveable frames are made, by merely morticing cross and side-braces into the posts near the top and bottom. They may then be moved about conveniently. When net hurdles are used, it is necessary to have other shelves, with either board or paper bottoms, to slide under the net hurdles two or three inches below them, to catch the filth that falls from the netting above. Some have them made like the frames of the hurdles, and covered with thin cotton cloth; others cover them with paper. But I think thin boards will be found most convenient, and, in the end, cheapest. The great object to be gained in choosing the kind of hurdles is, to accommodate the greatest number of worms in the least possible space, and yet to allow them sufficient room, with a free circulation of air, and also to be convenient for feeding and cleaning. The frames for the hurdles should therefore, be arranged in rows, with alleys between them, wide enough to afford room for the attendants to pass freely, with, with large baskets of leaves. The alleys ought to be, at least, four feet wide.

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* M. Amans Carrier's—republished from Farmers' Register, (p. 89, vol. vii.)—Ed. F. R.

Hatching the Eggs, and Feeding the Silkworms—next claims attention. The proper season for hatching the eggs is, when the mulberry leaves, in an ordinary season, have attained the size of half a dollar. Naturally, the silkworm will hatch without human aid, simultaneously with the developement of the mulberry leaf; but it is best to keep them back a week or two if possible, that the leaves may attain some size. If the eggs have been kept in an ice-house, it would be well to take them thence to a cellar, and thence to a cool room, leaving them twenty-four hours in each, and then to the hatching-room. A sudden transition, from the low temperature of the ice-house to that of the hatching-room, might injure them. When they have been kept in a cellar, they ought to remain a day or two in a cool room before exposure to the warm hatching-room. If the weather be warm, the hatching-room will be warm enough without artificial heat; but, if it be below 70°, it ought to be raised to that degree by means of a stove. The hatching-room may be any small room that can be conveniently kept warm, and should be provided with hatching-tables; these may be ordinary plain tables, of a sufficient size to accommodate the number of eggs to be hatched. A table ten feet long and three feet wide, will accommodate a million. The sheets of paper containing the eggs are to be spread out on the tables, and left to hatch. All that is to be done, is to keep the room warm, and to increase the temperature gradually, for which purpose a thermometer in the room is convenient. After a few days' exposure in the hatching-room, the eggs will begin to hatch; but very few will come out the first day, and need not to be attended to. On the second day, a large number will come out, and then mulberry leaves must be laid over them, when the little worms will soon attach themselves to the leaves, and must be removed to another table, by taking hold of the stem of the leaf, and bearing it to the table. The table should be marked, to indicate the first-day's hatching, as the produce of each day must be kept separate from the others. The same course must be pursued with the next day and the day following, but not longer, for the few worms that do not come out during the three days are not worth attending to, and should be thrown away. The worms always come out in the morning, and should be removed to their tables and fed immediately, the leaves on which they were removed being their first meal, and will last them till towards evening, when fresh leaves should be laid over them.

Cutting the leaves.—Some persons direct the leaves to be cut into small pieces while the worms are small; but I never could discover any advantage in it, as the worms will cut them fast enough, as Mr. Whitmarsh well remarks. A young worm, not two hours old, will cut through the middle of the oldest and hardest mulberry leaf in two minutes. In feeding the worms, my rule is, to give them a few leaves at a time, and to supply them with fresh ones as often as they consume them—night and day. It is directed by the French and Italian writers, that a certain quantity, by weight, must be given them a certain number of times each day; but I have always found that they do best, begin to spin their cocoons soonest, and make better and more silk, when fed as much as they can eat, night and day, from the time they are hatched till they begin to spin. I do not recommend large quantities of leaves to be laid upon the hurdles at one time; but rather moderate ones, and that they should be continually watched, and supplied with fresh food as often as the former supply is consumed, or becomes in the least *wilted*, even if they require feeding every hour. I cannot sufficiently impress upon the mind of the reader the importance of this rule. On a previous page, I have given the results of the contrary practice and that here recommended, in parallel columns, and I once more assure the reader of the correctness of those results. It may startle some persons to be told that they *must* attend to the worms at night, and therefore it is as well to inform them that they need not do so; that they will make excellent silk and a fair profit, too, by feeding well during the day; and giving them a full feed on leaving them at night. But they must be informed that, for every two nights they omit feeding the worms, one day will be added to the time of feeding, and that the produce of silk will be diminished in proportion as the time is lengthened.

The moulting (or shedding of the skins) of the worms, takes place four times, and generally from five to seven days apart, depending on the manner in which they are attended. Those fed upon the *high pressure* system, (above recommended,) will moult every four or five days; and those fed upon the ordinary system will generally moult every seven to nine days. These periods of moulting are of no other interest to the attendant, than affording convenient periods for cleaning the hurdles, which should be done as soon as the worms revive. The times of moulting will be readily seen, by the worms neglecting their food, concealing themselves under the leaves, &c., and appearing to be asleep. At these times, no food should be given them, nor should they be molested in any way. They generally remain dormant about thirty hours.

Cleaning the hurdles.—As soon as they appear to have revived, some large fresh leaves should be laid on them, and as soon as they attach themselves to the leaves, they may be removed to clean hurdles, by laying hold of the stems of the leaves, as above directed. For the two first ages, this is the best plan for cleaning them. However, many persons never clean them at all till the third moulting. It should, however be observed that, where much litter and filth have accumulated, the hurdles should be cleared of it; for if warm damp weather occurs, it will be likely to cause fermentation, and disease in the worms.

After the third and fourth moultings, the most convenient mode of changing and cleaning the hurdles is, to place a net-work hurdle immediately over the worms—so near them, that they can readily ascend upon it through the meshes, and place fresh leaves on it; the worms will soon get upon the fresh hurdle, and the lower one may be drawn out, and the filth carried off.

Until after the two first moultings, the worms will occupy but a small space; they will require about double as much space after the first moulting as they occupied previously, and should be distributed to it when the hurdles are cleaned. For example: the worms that occupied one hurdle or table fully, up to the time of the first moulting, should be distributed on to two hurdles when they revive; after the second moulting, they will require four or five; after the third, ten to fifteen; and after the fourth, thirty to forty, or even more.

The cocoonery should be divided into three parts, or, at least, the worms should be kept in three distinct portions—say one portion in each end, and one in the middle—that each day's hatchings may always be kept by themselves. When the several day's hatchings have been kept promiscuously together, the moultings are irregular, and the formation of cocoons very inconveniently so. Besides, the worms that are moulting are disturbed by the feeding of those that are not, or the latter are injuriously kept without food. A successful result can scarcely be secured without attending to this.

The air in the cocoonery should always be kept *dry and pure*, and this is one of the difficulties to be encountered, that sometimes baffles the best exertions. Happily for the silk cause in our country, we are blessed with a climate peculiarly dry, and consequently better adapted to the production of silk than any other country except the north of China, and not less so than that. But we do often have times of damp, drizzly weather, and we must then resort to the use of fire. Mr. Whitmarsh's cocoonery is supplied with hot air furnaces under each end, from which he can, at any time, let hot and dry air into the room, and thus expel the damp air. I am well convinced that this is a very far better plan than stoves or fire-places. But whatever mode of drying be used, it must be applied whenever the air is damp, at all times during the feeding of the worms, but more particularly when they are spinning their cocoons, or beginning to spin.

I have never seen this part of the art of silk making treated with sufficient force in any European work. Writers generally refer to it, as a desirable condition of the atmosphere, but seem to attach little importance to it. Mr. Whitmarsh, in his late excellent little treatise notices it, and enforces the necessity of a dry atmosphere, with great judgment and propriety; as also does Mr. Ruffin, in the Farmers' Register. I am glad to receive the countenance which the concurrence in my opinions of such gentlemen affords. A writer in the last number of this Journal, (Dr. Emerson,) also enforces its necessity by explaining clearly and philosophically the reason of it, and I will now only refer the reader to his remarks. There is one point, however, which he has omitted to notice. The silk fluid, as it leaves the apertures of the worm, requires the aid of a dry, cool and pure atmosphere to make perfect silk. Before it is exposed to the air it is a thin viscid fluid, and without the aid of the air would remain so. Now if the air be very damp, its proper effect will be more or less prevented, and the silk will be flimsy, and of a very inferior quality; on the contrary, if it be dry, cool and pure, the silk will be of the best possible quality. When we dry the air by artificial means, it is true it will be warm; but it is better to be warm and dry, than cool and damp. But when heat is used to expel moisture, a free circulation can be kept up, which will be of great benefit.

Formation of Cocoons.—We now come to the mounting of the worms and spinning of the cocoons. I believe the best and cheapest contrivance for the worms to spin on, is small wisps of rye straw, about a foot long, tied firmly together at the lower end and spread out at the other. These are set in rows about a foot apart, across the hurdles or shelves, with their tops spread out and pressing against the bottom of the shelf above to support them in their places and to keep the straws spread apart. On a hurdle or shelf five feet long and two and a half wide, there will be three wisps in the rows across, and five rows, making fifteen to each hurdle. I was formerly in the habit of using broom-corn straw, with the seed cleaned off, the stem cut off close to the junction of the straw, and the top spread out as in the above, and always found the worms to do well with it. Mr. Whitmarsh, however, has tried both, and gives the preference to the rye straw. The worms readily climb into and spin their cocoons among the branches formed by the straws, and the cocoons are readily gathered from them.

Cocoon Frames, &c.—I have never seen any of the numerous *frames* that have been recommended for this purpose; but from the descriptions I have had of them, there appears to be several objections to them, viz: the trouble and expense of preparing them, and the labor of gathering the cocoons from them. The frames that seems to obtain most favor are those made by tacking laths edgewise across the bottom of the shelves, two inches apart, and then preparing small ladders of twine leading from the shelf below to the laths. It is said the worms readily climb these ladders, and spin their cocoons in the angles formed by the laths and the bottom of the shelf. It must be obvious, however, that a great deal of labor will be required to prepare them. I should suppose each frame would cost as much as all the cocoons it would contain would be worth. It is needless to be more particular with this part of the subject, as I have found that every body who has fed silk worms, has had sufficient genius to suggest an apparatus of some kind for them to spin on; and it is very rare that we find two persons who use exactly the same; and this fact leads to the inference that the worms are not very particular in this respect.

The time of spinning will be ascertained by the appearance of the worms. They will become somewhat transparent, of a slight amber color, cease eating, hold up their heads, apparently looking about for some object above them, and occasionally leaving fibres of silk on the leaves.

Whenever these indications are observed, preparation should be made for their accommodation with the wisps of straw, or other means. But few will ascend at first, but in the course of the first and second day they will nearly all have mounted. They must be looked to occasionally, and those that not readily mount should be put upon the straw by hand. The room should be darkened, and kept so from the commencement of the spinning, as they always mount and spin more readily in the dark than in the glare of light. If the weather be dry, the ventilators should also be opened, and as much air given them as possible, without producing a current of wind. If the weather be damp, it should be dried, and kept so till the cocoons are finished.

During the whole process of feeding and spinning, the cocoonery should be kept quiet; but this is particularly necessary while the worms are spinning. I once tried an experiment of the effect of a sudden shock upon them while spinning. When they had been two days at work, I let a large weight fall upon the floor; it made a loud noise, and jarred the house considerably. On reeling the cocoons, I found the fibre was broken invariably, when they were about half wound off. Various other experiments satisfied me that they require quietude to enable them to finish the cocoon with an uninterrupted fibre.

The worms generally require about four days to finish the cocoon; but they should generally be left undisturbed six to eight days from the time of the last of their mounting, when the cocoons should be gathered and reeled immediately, or cured for future reeling.

Curing the Cocoons.—Various expedients are resorted to for smothering the chrysalis in the cocoon. In Europe, they bake them in ovens constructed for the purpose—the heat being regulated so as to prevent scorching the silk. The heat of the sun in this country is generally sufficient to kill them, and it is recommended as the simplest process by various writers. They spread the cocoons out for several days to the sun, until they become dry, when they may be put away in a dry room for future use. Great care is necessary, however; for, if they are not killed, the moths will make their way out of the cocoons, and thus spoil them; and if the cocoons be stored before the chrysales are sufficiently dry, the moisture will spoil the cocoons. A little experience will enable any one to judge when they are properly cured. When they are thoroughly dry or cured, the chrysales can be rubbed into powder with the thumb and fingers. Believing this plan to be the best, it is deemed unnecessary to describe the others.

If time allow of its being done, the cocoons should be reeled without curing, as they reel much more easily than when dried.

Providing Eggs.—Before curing the cocoons, enough should be selected to produce eggs for the next season. They should be *the best*; for, we must infer that the worm that makes the best cocoon was in the best state of health, and will be most likely to have the most healthy progeny. Two hundred and thirty cocoons will make an ounce of eggs, or 40,000; but in selecting them, it is best to take two hundred and fifty for each ounce of eggs required for next season, that due allowance may be made for losses from various circumstaces, such as death of moths, &c. These cocoons should be spread out on a table, and in about ten days from the time the cocoons were finished, the moths will come out, and couple, when they should be placed on sheets of paper, the room darkened, and left to themselves. They will separate of themselves, and the females will deposite their eggs on the papers. As soon as the papers are covered with eggs, they should be rolled up, and placed in some metal or earthen vessel, and kept in a cellar or ice-house till wanted next year. Be careful not to close them air-tight, or the eggs will *be killed*, as they require the aid of air just as much as animals do.

Rats, mice, ants, and cock-roaches are destructive to silk worms in all stages of their existence, and must be guarded against.

Silk worm eggs are not injured by any degree of cold; but they should not be exposed to great changes of temperature suddenly; for this reason, they should be put in a cellar or an ice-house, and kept constantly there till wanted for hatching. If kept in an ice-house from the time they are first laid, they may be kept from hatching till the latter part of the next summer, and thus successive crops may be reared. I am not prepared to say, however, that successive crops will be found profitable. I still believe that one crop, at the proper season, will be found ultimately the most profitable. I also think it very probable that keeping the eggs from hatching much beyond the natural period, will be very likely to injure the constitution of the insects. If this plan be resorted to, therefore, I would recommend that eggs for next year's use be always produced from the first crop. This plan will obviate all difficulty on that score, as the worms of the first crop will never be subjected to the protracting treatment. Besides, you will then always be sure of a supply of eggs for next year, whatever accident may befal the succeeding crops.

Diseases of Silk Worms.—The French and Italians describe many diseases to which silk worms are subject, and attribute them to various causes. Cleanliness and pure dry air, however, are the only preventives, as well as remedies, and it is, therefore, deemed unnecessary to go into details. Those who keep their cocooneries properly ventilated, and free from damp, and their hurdles clean, will have no diseased worms; or, if disease does occur under such circumstances, there is no remedy for it, the cause being attributable, probably, to some mismanagement of the eggs, or the worms from which the eggs were obtained having been unhealthy. When disease is caused by foul air, arising from filthy hurdles, or other effluvium, the cause of the foul air must be immediately removed, by cleaning the hurdles, and removing the filth, and sprinkling the floor with a solution of either the chlorides of lime or soda. The diseased worms should also be immediately removed.

It is a good plan to have a couple of days' supply of leaves always gathered beforehand; so that, in case of rain, feeding with wet leaves may be avoided. The importance of avoiding wet leaves will be learned from experience by all who neglect the precept.

I must conclude this long chapter with the remark, that notwithstanding the long time necessarially occupied in the description, the practical operator will find the whole art of raising silk worms exceedingly simple, and easy of performance, and entirely within the capacity of the most ordinary persons. Little children readily comprehend, and can *perform* the whole, after once practising it; and they would never require adult supervision, but for their liability to negligence. All capacities are capable of *performing*, but few of directing the work. The art of silk-making, though simple and easily acquired in all its parts, requires the strictest attention, that every act, though extremely simple in itself, be done at the proper time, and in the proper manner.

MALARIA—ITS EFFECTS IN PRODUCING COUNTRY AND OTHER FEVERS.

From the Southern Agriculturist.

Mr. Editor—Believing that the following remarks on the laws which govern the production and propagation of malaria, may in a measure be useful and interesting to many of your readers, from the fact of the prevalence and fatality of what is termed country fever amongst our inhabitants, and especially the agricultural portion, I have been induced to submit them to you for your journal, if you think them worthy of a place in its pages. I have condensed the subject very much, from the circumstance of the limit of a journal like this, and have only detailed some very striking facts which cannot fail to be interesting.

The first law we shall notice in regard to the propagation of malaria, is that it obeys the motion of the atmosphere, being conveyed by winds to some distance from the locality where it is generated, with equal if not greater fatality. It has often been attempted to ascertain the precise or probable distance that malaria can be conveyed by winds, to produce fever; but all such attempts have failed to establish any exact or certain distance. Notwithstanding this, cases are related where it has been transmitted to the distance of even three miles. The convent of Camaldoli, in Italy, is an illustration of this fact. It is situated on a very high hill, three miles from the lake Agnano, which is the nearest source of malaria, producing remittent and intermittent fevers amongst the inmates. We are informed by a writer on the climate of Italy, that out of seventy-six unhealthy towns and villages, thirty-five are situated on hills some distance from the locality likely to produce malaria. The marshes about Ereth in Kent, says M'Culloch, are less injurious to the inhabitants of the lower grounds near them, than might be expected, while their effects on the houses which are situated high on the hills above, is such as at different times to have been severely felt by the inhabitants. This circumstance he attributes to a current of air so directed, as to escape the low grounds, while it ascends and affects the eminences.

The distance at which malaria may produce its effects, constitutes a subject worthy of inquiry; for individuals living in the country often think the location of their residence safe, because they have no standing water near them, when there is a swamp, or a low piece of ground some distance off. When fever prevails, they seldom or never think or believe, that the exciting cause may be only a mile or two miles off; but they imagine the sickness to be of a peculiar nature, not in any way attributable to the immediate locality. These hints may prove useful to many of my readers in the choice of their summer residences, which ought to be a few miles from any locality to generate malaria.

Writers on the diseases of warm climates have stated many facts in relation to this part of our subject, which are highly interesting and important. Some of these authors do not think that this poison can produce disease at the distance of more than a quarter of a mile. Dr. Lind, in his observations on the preservation of the health of seamen, says, "that when Commodore Long's squadron, in the months of July and August, in 1744, lay off the mouth of the Tiber, it was observed that one or two of the ships which lay closest to the shore, began to be affected by the pernicious vapor from the land, whilst some lying further out at sea, at but a very small distance from the former, had not a man sick. At the same time, the Austrian army, under the command of Prince Lobcowitz, suffered so great sickness, through the proximity of their situation to the marshy country, that they were obliged to decamp." There is no doubt that the distance to which malaria may be conveyed, depends much upon the wind, which when strong, many waft this poison many miles. Dr. Bancroft, in his work on yellow fever, expresses himself strongly on this subject. "The distance, says he, to which the exhalations of marshy grounds may be conveyed from their source, and retain the poison of causing the yellow or other marsh fever, will partly depend on the force of the wind, and partly on the extent of the surface from which they arise—and on their being more or less copiously extricated from that surface. If the wind be very moderate, and blow steadily from the same point, and if the miasmata be abundantly emitted from a very great extent of surface, it seems probable that so large a mass of them as would thus be formed, might be conveyed a quarter and perhaps a half mile, before it became so diluted with atmospheric air, or so dissipated by the wind, as to lose its morbific power." This is only supposition on the part of this author; but the case cited before of the convent of Camaldoli, proves that it has been known to produce its deadly effect at the distance of three miles. A very striking instance of the action of the winds in conveying malaria, is given by Lancisi. Thirty persons of distinction in Rome having been on a party of pleasure towards the mouth of the Tiber, the wind shifted suddenly to the southward, blowing over some infectious marshes, and in a very short time twenty-nine of the party were attacked by fever.

Another important law in relation to malaria is, that it is dispersed by the the rays of the sun, for which reason the nights and the early morning are the most dangerous times to be exposed to miasmatic districts. The fog or vapor, when acted upon by the heat of the sun, is rarified, and becoming lighter than the surrounding atmosphere, ascends to some considerable height. By this process, the sickness on high mountains has been accounted for. Individuals exposed at night to malaria, have imitated this law of nature, by building up large fires, the heat of which has the same chemical effect as that of the sun. The use of fires in dissipating malaria, and rendering it innoxious has been long known and acted upon. We have the authority of Lancisi, Pliny and

Hippocrates, to prove its beneficial effects. Napoleon, whose mind was ever observant and active, tested it in one of his campaigns in Italy, and succeeded in preserving the health of his soldiers. A very strong case in point is cited on good authority. An individual, engaged in cutting wood in Africa, found that his work could not be carried on during the summer months, in consequence of the fever prevailing among the laborers. By way of expedient, he constructed a large number of earthern furnaces in the immediate vicinity, where the laborers were at work, and kept them constantly supplied with fuel, which burned all day; the result was, that before he made this arrangement, he had from 40 to 50 men sick a day, when in a short period they were reduced from 12 to 1. The night is dangerous too, on account of its being the time when we seek relief and rest from the fatigues of the day in sleep; the consequent relaxation produced by this state of the human system, renders man more liable to disease when asleep, then awake. During the prevalence of the fatal scourge, the cholera, which has devastated so large a portion of the inhabitants of the earth, it was noticed by every one that the majority of cases were attacked at night.

Malaria is also intercepted by trees with thick foliage, attributed to mere mechanical obstruction, the vapor settling in the foliage. The late Dr. Faust, of Columbia, in a treatise on malaria, has given a chymical explanation of this fact. He remarks, that "it is probable that the carburetted hydrogen accompanying the water, is obsorbed by the trees, and being decomposed, contributes to their growth in the same manner as carbonic acid." I am inclined to think that the utility of trees in preventing the propagation of malaria, is to be attributed much, if not more, to the mechanical obstruction which they afford, as the chymical change which takes place during the process of vegetation; for high fences or walls have afforded the same protection. In Rome, during the sickly season, the most prudent inhabitants, conscious of this fact, retire into their houses at sunset, close the windows and doors, and will not allow them to be opened until the sun has been up long enough to dissipate the fog. In this way they have kept from contracting fever, when their near neighbors, not making use of the same sulutary precaution, have sickened and died. Dr. James Johnson, who has bestowed much attentionon this subject, in his work on Tropical Climates, remarks: "During my residence near the marshes of Languedoc, I lived near a very fine building formerly the convent Franquevaux, erected on the very border of the marshes. The monks in the house were perfectly healthy, though few of the inhabitants of the environs escaped disease in summer or autumn. Tradition nevertheless relates, that they were accustomed in hot weather, to sleep on a terrace contiguous to the convent, a sure method of exposing themselves to disorders; but they were sheltered by a tent of double or triple convass, and this simple precaution, necessary against the musquitoes, proved, unknown to them, a still more certain protection against miasmata." Now this goes clearly to prove, that the safety of these individuals was entirely attributable to the mechanical obstruction afforded by the canvass. It is often noticed by persons with astonishment that one side of a street is the seat of sickness, and not the other: this can be accounted for on the same principle, one row of houses being more exposed than the other. This has even been noticed as regards large buildings, one part being perfectly healthy, and the other not so. It is said, that in the extensive hospital of St. Spirito, in Rome, the wards to the south and south-east are sickly, and the others quite healthy. We might mention many similar examples, which although highly interesting, we are compelled to omit, as we must proceed to examine some of the most evident causes of the increased unhealthiness of the low country of this state.

The change in the cultivation of rice from inland to river-swamps, I have no doubt, is a very fruitful cause. The deleterious effect of this change was to leave an immense extent of rice-fields abounding with stubble, from which, is said by the inhabitants of India, the poison is chiefly produced; and not being cultivated, there is always a sufficient quantity of water to do all the mischief. Extensive rice fields have been allowed to lay waste, by falling into the hands of individuals who had not the means of cultivating them. It is through this agency that we account for the sickness which now prevails in situations where the inhabitants spent their summers formerly, when every place was under high cultivation.

Clearing land is another fruitful cause. The surface of the earth with the vegetable matter, becomes exposed to the action of the sun, and malaria is readily formed; but when the surface of the land is throughly shaded, the agency of the rays of the sun is in a great measure cut off. This circumstance is proved by the fact, that summer residences in pine-land, in most cases, remain healthy, until the officious hand of man destroys the trees, and allows the heat of the sun to act on the land. It is said that it was for this reason that the Romans consecrated their groves and woods. Connected with this, is the turning of new land for cultivation in summer, which I think has been almost overlooked. The village of Pineville, which afforded so pleasant and convenient a residence for many families, and now almost entirely deserted, may be cited as an example of the injurious practice of clearing and cultivating land in the vicinity of a summer residence. The following instance is one of much importance, and deserves our attention.

During the summer of 1834, when the space in front of the Citadel, in this city, was in a state of preparation by ploughing the land, in order to level it for a parade ground, yellow fever, of a very malignant nature, attacked the soldiers, which I have no doubt was caused, if not aggravated, by the exposure of the land; there were very few cases in the city.

How often do we hear of digging ditches and drains in the summer causing sickness; which fact should show us the propriety of doing such work in the winter. The rich lands of the west, when first cleared and turned for cultivation, if done in summer will cause the deaths of many, which I think has already has been the case. Volney, Rush, M'Colloch, and many eminent writers, have noticed the fact, the breaking up for the first time of meadow land, for cultivation, is always attended with fatal consequences. A writer on the diseases of India, describes the disease produced by this process of cultivation, to be as fatal as the plague. Laborers residing but one night on the spot newly turned in summer, invariably die.

These causes I think serve in a great measure to account for the greater production and propagation of malaria in our own country now, than many years ago; for localities once the seat of sickness and death, have been rendered prefectly healthy, by removing the causes of production of malaria, of which we have spoken. Many situations' in Italy and India, may be cited at exemplifying this fact, but let us take an example nearer home. During my residence in Philadelphia, a few years ago, different parts of the suburbs of the city were pointed out to me, as being but a few years previous, as unhealthy as any part of our low country, which now is as healthy as any part of that beautiful city. This beneficial change has been effected by draining, filling up, and building, to the entire extinction of bilious fever. Dr. Caldwell, in his treatise on malaria, remarks, "that the large body of land adjoining Philadelphia, on the south, called the Neck, half a century ago, was but little better than a great morass. Nor did the Pontine Marshes surpass it much in the extent and violence of its autumnal diseases. But time and labor have converted it into meadows, fields and gardens, rich in the products of several kinds of cultivation. Nor does it flourish more in vegetation than in health. Its population is now dense. Such is the happy result of draining, banking and planting." I am fully persuaded that our own city may be extended, by pursuing the same process on the neck, which in many places is so liable to fever, owing almost entirely to their being so perfectly neglected, especially as regards draining.

Hoping that these remarks may be interesting to many of your readers,

I remain yours, truly,
W. G. RAMSAY, M. D.

ON THE EFFECT OF WATER IN THE AGRICULTURE OF ITALY.

By John Symonds, L. L. D. Professor of Modern History in the University of Cambridge.

From the Annals of Agriculture.

The favorable reception which my former paper has met with among those to whose judgment I pay the highest deference, has encouraged me to range in order my observations upon the *agriculture of Italy*, and to offer the result of them to the public. As the subject of this inquiry has not professedly been treated by any of our voyage-writers, it may fairly be presumed, that the reader will be disposed to examine it with candor. Every man who has investigated the course of husbandry in the country in which he resides, must necessarily have found himself often embarrassed; not only on account of the different modes of culture which prevail in different parts, but because the very persons upon whose information he relies, are frequently induced to disguise the truth, out of crafty and interested views. But, beside these circumstances, which are common to the Italians as well as to the English, there is a peculiar obstacle with which a foreigner has to struggle, in searching into the husbandry of Italy; I mean, the difficulty in understanding the language of the middle and lower classes of people, from whom he must chiefly derive his knowledge. The rude dialects in Italy do not vary more in different governments, than in the provinces which belong to the same government; insomuch, that a man may have acquired a competent knowledge of the language in general, and yet be almost an utter stranger to the terms, and to the jargon, which are in common use among the peasants. It is highly probable, that, notwithstanding my long residence in Italy, I have frequently been deceived myself; and, as I should be sorry to deceive others by pledging the truth of facts which may admit of doubt, it behooves me to declare, that I do not take upon me to write a system of Italian agriculture, but only an essay upon it; or rather a series of remarks made upon the spot, and disposed with all the exactness of which I am capable; and, should they not meet with that approbation to which an author naturally aspires, they may, at least, be of use towards inciting others, who have more leisure and experience, to enlarge and improve the design.

In order to explain myself with clearness and precision, which is all that the reader can be prepared to expect upon a subject of this kind, it will be proper to point out the method which I intend to observe.

I. To examine the physical causes that facilitate or obstruct agriculture; by which are to be understood the rivers and torrents, the soil, the climate, and the general face of the country.

II. To consider the moral causes that in any degree affect it; by which, I mean, the nature of the government, the distribution of justice, the modes of taxation, and many other material circumstances that will offer themselves to our discussion under this head.

II. To inquire into the price of labor, the course of crops, the general system relating to manures, and the culture of particular plants; in short, to take a view of what properly constitutes the practice of the art.

IV. To see what inferences may be drawn from the facts above-mentioned, so as to enable us to form a comparison between the ancient and modern agriculture.

Were I to speak of the physical causes which operate upon agriculture in other countries that lie out of the neighborhood of high mountains, I should begin with examining the nature of the soil, upon which the quality and value of the produce almost entirely depend. But the case is different with several parts of Italy, where the soil itself owes its existence to water, having been formed by numberless particles of earth brought down from time to time by streams and torrents. Thus, in the Bolognese, one can scarcely dig to the depth of a few feet, without meeting with such kinds of stones as are commonly found in torrents; which naturally leads us to conclude, that the soil has been brought to its present state by the gradual increase of successive ages. The same, indeed, may be observed of the whole plain of Lombardy, which may properly be called the gift of rivers; just as Egypt was denominated, in ancient times, the gift of the Nile. It is also manifest, that the vallies in Tuscany have either been entirely formed, or greatly altered, by the inundations of rivers and torrents. Add to this, that the constant supply of water, with which a great part of Italy is refreshed through the means of artificial canals, does not only carry with it a considerable addition of earth, but creates, as it were, a new soil every year. Hence it appears, that it is necessary to open our inquiries by explaining the effects of water, in order to ascertain the nature of the soil. I shall proceed, therefore, to consider the three following particulars: the detriment which has accrued to Italy from streams and torrents; the benefits which it has received from them; and the mischiefs which some parts sustain from the want of wholesome water for the common purposes of life.

I. In speaking of the Italian rivers, our first thoughts are carried naturally to the Po, which was celebrated for its rapidity in ancient times; and which, for some centuries, has been separated into two vast branches; one of which is sub-divided into the Primaro and Volarno. Although it swells not to a considerable breadth before it receives the Tesin, yet it does a great deal of damage within twenty miles of its source; insomuch, that the farms between Racconigi and Carignano, which are subject to inundations, bear a small value in comparison of others of the same quality in the neighborhood, that are secure from danger; and this is the case with most of the estates situated near the Po. Such is the quantity of stones and sand that it carries along with it, that when it merely overflows the adjacent lands, the peasants cannot bring them into a proper state for some years; but, when it breaks its banks, the mischief is very extensive; for sallows and willows spring up spontaneously, to the utter exclusion of corn and pasturage, for a long tract of time. We see immense copses of these aquatics on the banks of the Po, through the whole vale of Lombardy; and, in particular, between Tortona and Pavia, and near Broni and Cremona. Yet this inconvenience, great as it is, must necessarily appear trifling, when compared with the terrible effects of the inundations in the lower parts of Lombardy, where some of the most fruitful spots are converted into the most barren marshes.

Although the other rivers in Piemont are not so impetuous as the Po, yet, since they rise in the Alps, their descent is excessively rapid; and when they are augmented by accidental torrents, they never fail to cover the plains with sand and pebbles; whence it is that the soil is so ungrateful from Chivasso to Turin, and likewise to Savigliano; insomuch, that the peasants would be reduced to extreme misery, were it not for their skill in deriving some advantage even from their distresses.

But beside the losses which the inhabitants sustain from streams and torrents rushing down precipices, there is an additional circumstance which aggravates the misfortune; I mean, the ruinous effects of the cultivation of the mountains. It was the custom of the ancient Romans to set apart the plains for tillage; the hills for vines and olives; and the mountains for wood and pasturage.

*Bacchus amat colles, aquilonem et frigora taxi.** The Italians have, in a great measure, reversed this practice, though dictated by good sense and experience; for they have grubbed up the wood, and converted into arable land both the sides and summits of the mountains; in consequence of which, the earth, being no longer supported by the roots of the trees, tumbles down in the rivers, together with vast fragments of rocks and marble, and completes the destruction of several rich vallies. We see no where such fatal effects of this practice, as in the territories of Venice. The produce of the mountains formed a part of the demesnes of that republic, which used either to let it at a moderate price, or to distribute it gratuitously among the inhabitants of the adjacent parishes; and, as long as proper covenants were observed, there was abundance of fine timber, as well as excellent fodder for oxen and sheep; but, in the last century, the Venetians being distressed for want of money to continue the war, sold, to individuals, these rights, or *beni comunuali*, as they are called, without subjecting them to any restrictions, than which, nothing could be more impolitic or imprudent; for, as they were allured by the profit on the first breaking up of grass-lands, they took a few crops of corn in one place, and, as soon as the soil was washed away, made the like attempts in another; so that, in a short time, the chief part of the mountains was reduced to culture; whence it cannot be wondered, that the Venetians have neither a sufficient quantity of pasturage for their cattle, nor of wood for fuel, and common utensils, and implements of husbandry. Monte Baldo, which hangs over the beautiful Lago di Garda, and which was once as famous for timber as medicinal plants, is now entirely naked, and exhibits the most dreary sight imaginable. It is difficult, indeed, to determine, whether the republic has suffered most from the loss of wood and pastures upon the mountains, or from the diminution of corn in the vallies. The Adige, incapable of being controlled, has destroyed above 20,000 acres of the best lands in the Veronese. The Brenta has ruined the vale fom Baffano to Borgo, as well as some of the richest spots of ground in the Padouan. The Piave* has laid waste an immense tract of land in the delicious environs of Treviso; and the province of Triuli is desolated by rivers. It is melancholy to see how the plain between Pordenone and Codroipo, near twenty miles in length, is ravaged by the Silo and Tagliamento, which bring such heaps of earth and stones along with them, that they choke up the very shallows in the *Lagunes*. Not many years ago, the republic prohibited, under severe penalties, the cutting down of the wood upon the mountains; but the mischief was done, and perhaps, it is irreparable.

Among the rivers that fall from the Appennines into the Bolognese, the Reno is the most rapid and dangerous. History affords us few instances of greater damage occasioned by the diverting of a river from its proper channel. Clement VIII. removed the Reno from the Po, into which it used to empty itself, with a view of gratifying his new subjects the inhabitants of Ferrara, who wished to avail themselves of that water to improve the valley of St. Martino; but his Holiness's infallibility forsook him upon this occasion, for he did not foresee, that the inundations would destroy a third part of the plain of Bologna. It is generally supposed, that the cities of Ferrara and Bologna have not expended less than 250,000l. in law-suits, which have been carried on at Rome for more than a century; but the address and intrigues of the former have had the greatest influence in the Papal cabinet; insomuch, that it is but very lately that the Bolognese have been allowed to take proper measures to repair the devastation, though, I fear, that the remedy will be but temporary.

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* Virg. Geor. l. 2. v. 113.

* It was in this river that Colonel Villiers was drowned, which gave occasion to Mr. Prior's beautiful imitation of an ode of Horace.

In the Dutchy of Parma, the brooks swell so much upon sudden rains, that they cannot be passed without great danger; which is more particularly the case with the rivers. The city of Parma is divided into two quarters, by a river of the same name, that has a vast bed, and yet is dry half of the year; than which, nothing can render a capital more unsightly. The Taro is split into a variety of streams, and sweeps away whatever it meets with in its course; and the Sturone, which runs near Borgo S. Domino, is often so rapid, that it cannot be ferried over, but must be passed by a wooden bridge, which is scarcely to be paralleled in Europe. It is 675 English feet in length, and not much more than seven feet in breadth; and the carriages are drawn by men instead of horses. I do not remember to have seen any thing of this kind so alarming and dangerous, for the materials are in a very bad condition, and it looks as if it was designed originally for a foot-bridge. These rivers roll liquid mud of so very cold a nature, as to be extremely prejudicial to vegetation. About two miles from Piacenza we cross the Trebbia, the celebrated scene of Hannibal's victory; but it is now no more than a torrent, which is dry during the summer, and in winter lays waste all the adjacent country; and not far from it is the Tidone, which covers the fields with so much sand and gravel, that they are rendered quite unfruitful. It is observable, that almost all the rivers in the Parmesan and Piacentin, make so miserable a havock in the plains, by reason of the cutting down of the woods upon the mountains. I had an opportunity of seeing a large range of them, and, in particular, the *Canneto*, which the Farnese family let to a company of miners, in search of copper. The design proved unsuccessful, and the woods were rooted up, to the lasting prejudice of the state.

Whoever compares the adjacent provinces of Voghera and Tortona, must needs see the reason why the former is so much more productive, though the soil is not naturally so fruitful; for the latter is subject to the inundations of the Scrivia, and other rivers, which have impoverished it so much, that they are obliged, in many parts, to fallow every other year; and, indeed, we see only half-starved crops of corn from Tortona to Novi. It is natural to imagine, that the Genoese dominious, which consists, for the most part, of rocks and precipices, should be ravaged by torrents; but one would hardly expect to find a valley totally destroyed, that conducts us to a magnificent capital. In the space of about six miles, between Campo Morone and Genoa, we are compelled to cross the Polcevera above forty times; a circumstance that reflects discredit upon the republic; for, though it were not possible to make the road upon the old bed of the river, as new channels are continually forming, it might have been carrid across the declivities, as in other hilly countries.

It is commonly said, that Tuscany is cultivated to the best advantage; but whatever opinion may be entertained of it in general, it is certain, that it has received no small detriment from introducing tillage in the mountains. Hence it is, that such exorbitant expences have been incurred in confining the Arno within proper bounds; but no art or contrivance can check the progress of the Ombrone, which has ruined a large part of the fine plain of Phisoia; and the further it goes, the more is its course marked out by desolation. The wood and pasturage in the mountains of Pistoia, were given to that city by the Grand Duke in the 16th century; and have been as improperly treated as the *beni comunuali* in the state of Venice; so that one cannot wonder that the Ombrone, and other rivers which rise in these mountains, demolish the plains, that they were intended by nature to benefit. Many vigorous edicts have been published by Grand Dukes against this pernicious practice, even as late as this century; but they seem to have proved ineffectual, for the Tuscans are neither provided with pasture enough for their cattle, nor with wood enough for the common purposes of life; most of their mountains having been converted to improper uses.

The Pope's territories upon the Adriatic, present us with scenes uncommonly beautiful; frequently large towns, and a succession of the most lovely green hills imaginable; with prospects perpetually shifting, and administering every moment fresh entertainment; but the pleasure which arises from the variety of fine landskips, is considerably abated, when we reflect upon the miserable condition of the plains which we pass through. The country about Imola is laid waste for several miles by the Santerno, as that about Facuza by the Amone; but these rivers do little harm in comparison of the Ronco and Montone, which are united near Ravenna; and which would have destroyed that city and its territory, if it had not been for the bridge erected chiefly at the expense of the Pope Corrini. About two miles from Fano we cross the Metro, which overwhelms a vast circuit in the neighborhood, though not more than fifteen feet in breadth, were it confined within its proper channel. All the rivers above-mentioned, as well as many others which rise in the Appennines, contribute their utmost to the ruin of the country between Bologna and Sinigallia, by reason of the quantity of sand and stones which they bring along with them; a misfortune which would not probably have happened, had not the mountains been stripped of their wood; of which there is now so great a scarcity, that it is usual to purchase it in the Neapolitan dominions.

Whatever disadvantages agriculture may labour under in the kingdom of Naples, it is certain, that greater attention has been given to the preservation of timber upon the mountains, than in other parts of Italy. I observed this in the Terra di Lavoro, and in the Abruzzo's and the Contado di Molise, which produced the brave and hardy race of the Samnites and Marsi, and which now furnish the crown with the best troops. The largest ridge of mountains in the southern parts of the kingdom is in Calabria Citra, and is called *sila*, the name that it bore in ancient times*. Upon the summit of it there is a plain near forty miles in length, and twenty in breadth, which they have reduced to culture; but the sides are

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* See Strabo, l. vi. p. 400. ed Amst. 1707.

covered with pines that supply the kingdom with turpentine, pitch, and rosin; and, as these trees are the property of the crown, they are preserved with the utmost care, and renewed as occasion requires; so that the rivers, which rise in such abundance in the *Sila*, are prevented from sweeping away the soil and the stones from the mountains. However, it is evident, that these rivers, as well as most of those which fall from the Appennines, are of singular detriment upon another account; for if they overflow the plains in ever so small a degree in the spring or summer-time, they render the air unwholesome in this sultry climate. In my journey through Magna Græcia, in the middle of April, I found a great part of it so infested with noxious vapors, that I could not sleep with safety in many places. The same may be observed of the plain in Apulia. In the road between Foggia and Manfredonia, we cross no other river but the Candelaro, which infects the whole neighborhood, whenever it expends itself a little more than usual; and the Cervaro and Sancinaro, between Foggia and Cerignoal, produce the same effects. It is only by three contemptible streams that this vast level is watered; a circumstance which shows the peculiar propriety of the expression of Horace[*]:

Et qua pauper aqua Daunus agrestium
Regnavit populorum———

11. Under this head I shall briefly mention the benefits which result from the rivers in Italy, as far as they enable the inhabitants to make canals for the sake of inland navigation, and to flood their lands.

Notwithstanding the rapidity of the Po, the cities and towns, seated upon the banks of it, ship off their goods and manufactures for distant markets; and, as one mouth of the Po, called the *Porto di Gero*, is always navigable, a constant passage is opened into the Adriatic. Beside this, there are communications between the Po and the principal rivers that fall into it; by which means every province enjoys, in some measure, the advantages of a maritime situation. As early as the 12th century, the canal called the *Naviglio grande*, was conducted from the Tesin as far as Abbiate; and was carried to Milan in the following century. The *Naviglio della Martesana* was begun by Francis Sforza in the year 1457, being a cut from the Adda; and, not long after, was brought to Milan by the celebrated Lionardo da Vinci. These canals are joined to a third which leads to the Po; so that Milan, though an inland city, is possessed of the chief advantage that can promote commerce or agriculture. There is a canal made out of the Serio in the province of Bergamo; and another likewise out of the Chiese in the Brescian, which forms a communication with the Po. But of all the provincial cities in Lombardy, Padua is the most conveniently situate in this respect: there are no less than seven canals that run through it; insomuch, that one may go by water to a great part of the neighborhood; and there is scarcely a farm in the whole territory that is more than four miles distant from a navigable stream; and it is farther to be remarked, that the canals have a communication with the Adriatic, as they are joined to the Brenta. These noble works reflect a lasting honor upon the Carrarefi, whose lives would have been truly laudable, if they had not been sullied by acts of cruelty towards their subjects the Paduans. At Bologna there is a canal that is formed out of the Reno, and goes to Ferrara; and from this city another conducts us to the Po; and it is the same in regard to Mantua and Modena. It is certain, that Lombardy, from the nature of its situation, is admirably calculated to promote the purposes of husbandry, as well as of trade; and though so great conveniences are not to be found in other parts of Italy, yet they have not been negligent in this particular. The Lucchese have done their utmost to improve their scanty territory, by making a canal to carry their commodities to Viareggo, the only sea-port of which they are possessed; and it is their misfortune, and not their fault, that the canal extends no farther than seven miles; for so very steep a mountain comes in the way, that they are forced to carry every thing upon mules for five miles from Lucca. The Tuscans have not been deficient in the making of canals; and some are to be met with in the Neapolitan dominions, and in the Poe's territories which it would be tedious to recite.

As to the flooding of lands, the second point which I proposed to speak of, we have undoubted reason to imagine, that it was practised by the ancient Romans; for, not to mention what has been said by Virgil and Columella upon this head, we have an opportunity of seeing two conduits near Terni, which were evidently used for this purpose; and of which the present inhabitants avail themselves to the singular benefit of that delicious vale. It is impossible to determine the precise time when this practice went into disuse; but it is probable, that it happened in the fourth century, when most of the useful, as well as elegant arts, were neglected and despised. Those who entertain no other ideas of the Goths, but such as express horror and desolation, will be surprised to find, that the revival of this branch of husbandry is to be ascribed to a Goth alone. Theodoric, the first of those Gothic princes who reigned in Italy, shewed a remarkable attention to the establishment of civil polity, and to the preservation of Roman buildings; nor did he disdain to turn his thoughts towards improvements in agriculture. The encouragement which he gave to drain the Pontine marshes, indisputably evinces this fact. But we need no other proof than his letter to Apronianus, wherein he orders, that a public stipend should be granted to an African, who had come to Rome to teach the method of watering lands.[*] The prosperity and reputation of Italy sunk with Theodoric. The savage manners of the Lombards, and the series of rapine and devastations, which followed one another in the times of Charlemagne's successors, introduced into Italy that universal barbarism, which by degrees, overspread all Europe; and, it is probable, that it would not so soon have emerged from it, if it had not been for some beneficial consequences that attended those frantic expeditions, the Crusades. Among other useful arts imported from the east, the followers of the cross brought into Italy that of flooding lands, which seems not to have been practised in this country after the ruin of the Gothic empire. They had been accustomed to behold the most delicious scenes upon the banks of the Orontes, where the plains resembled a beautiful garden, cantoned out into a variety of partitions, and refreshed by plentiful streams; and the impressions which they received upon the spot were so strong, that they were not effaced after their return into Italy; whence it happened, that new modes of culture were introduced, which, at once embellished and fertilized this country.

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[*] Od. xxx. lib. 3 ·v. xi.

[*] "Magnitudinis vestræ relatione comperimus Aquilegium Romam venisse de partibus Africanis, *ubi* ars ipsa pro locorum siccitate magno studio semper excolitur, qui aridis locis aquas possit dare vernatiles, ut beneficio suo habitari faciat loca, nimia sterilitate siccata." Cassiod. Var. lib. iii. 53. The whole letter is very curious, though it enters too minutely into the advantages of irrigations; a proof, however, that they were not practised in Italy. Cassiodorous was secretary to Theodoric; and his twelve books, which contain original letters and dispatches, respecting this prince and his successors, are a most valuable body of materials.

The Piedmontese and Milanese were the first who profited by the example and instruction of the Crusaders. Every spot of ground in Piedmont that is capable of irrigations, has been made to contribute its utmost to the owner; and indeed were it not for this advantage, the whole province would be miserably barren. It is pleasant to see how the very rivers which lay waste the plain from Chivasso to Turin, as it has been intimated above, make some amends, by submitting to be divided into little streams for the improvement of the lands. Coni is situated near the confluence of the Stura and Gesso, which have destroyed above 500 acres of land in the neighborhood; and would have threatened the ruin of the town itself, if it had not stood upon an eminence; yet these rivers are greatly conducive to the general fertility of this part of Piemont; the Gesso, in particular, being famous for the warmth and fruitfulness of its waters, which are supposed to be owing to the minerals of the *Bagni Vaudieri*, with which it is impregnated. From Coni to Limoni, the vale is watered partly by the Gesso, whose streams are admirably conducted; and partly by the Varmenagna, which greatly contributes to the rich crops, both of corn and grass, with which this tract of land abounds.

In the way between Turin and Mount Cenis, diversified with wild and magnificent views, we cannot but be struck with the sight of the meadows, which, at particular seasons, are equal in point of verdure to any in England. These meadows are watered by the Duria, which descends with vast impetuosity from the Alps, and causes frequent devastations; but suffers itself, in return, to be confined within narrow drains and trenches, so that it may be carried on, or drawn off at pleasure. The valley is closed at Novalese, where they shew strangers a cascade above an hundred feet in height, and scarce more than five in breadth; but, contemptible as it is, it has furnished a rill for the use of the adjacent lands; and though the ascent from Novalese is wonderfully steep, and sometimes almost perpendicular; yet even here the Duria is made subservient to irrigations.

If a man would see this art carried to the highest point of perfection, he must visit the state of Milan, where every part, except to the northward, bears a testimony to its beneficial effects. So long ago as the year 1220, the famous canal of *Muzza* was made from the Adda; which, being afterwards joined to another, gave an opportunity to flood the whole province of Lodi. We frequently meet with streams above streams, crossing one another in all directions; and sometimes so complicated, that we can hardly discover whence they came, or whither they are going. When I was at Lodi in 1768, the number of cows in this little province amounted to 30,160; and I heard from unquestionable authority at Milan, that the inhabitants receive commonly 70,000l. a year for the cheese which they sell to foreigners, independent of what is reserved for their own consumption. There is no doubt but that this must be attributed to the Adda, for the soil is naturally meagre; and, indeed, it appears, that the quality of the soil varies, according as the Adda approaches nearer to the Po. The Adda at first moves very slowly, and very few land-floods fall into it, as it passes through the lower part of the province; and we find, that the contiguous lands are not rendered very fertile; but as soon as the river enters the upper part, it has a much quicker descent; the water is not only softened and meliorated, but also enriched by the land-floods, which bring a considerable quantity of manure; and that kind of fruitful mud is conveyed to the fields, which the Italians call *il fior di terra.* We see the superior effects of it about Codogno, and the lands adjoining to the Cremonese, where the *marsh-bent*, and other valuable grasses, are found in much greater plenty. I cannot help observing though it may seem foreign to the purpose, that there are no permanent meadows in this province, which produces the cheese, so well known under the name of *Permesan;* for it is the constant practice to break them up every three years, and to lay them down again, after taking two crops of wheat, and one of flax, or millet, or maize; it being proved by experience, that if the meadows in this province are not managed after this manner, the water makes the grass coarse and sour, and very prejudical to the taste of the milk. On the contrary, there is a vast range of meadows in the environs of Milan, which are never broken up, because the water is never let over them; the soil being admirably adapted of itself to throw out the best sort of grasses.

In the territories of Venice, irrigations are very frequent; for, not to mention the use of them in the Trevisan and Paduan, we see a singular instance of their efficacy in the neighborhood of Vicenza; where the Bacchiliogne repays, in some measures, the mischief that has been done, by bringing a sort of calcareous earth, which quickly dissolves and fattens all the contiguous lands. There are meadows in this province mowed three times, though they lie at the very foot of the Alpse. I observed it more particularly in the Valdagno, which is washed by the Agno, full of sand, stone, and ballast; and I could not account for the benefit arising from it, but by supposing, that it was of use towards binding the mucilaginous parts of the roots together. In the province of Brescia, there is scarce a field which is not watered; and were it not for this advantage, the inhabitants would be extremely poor; for the soil inclines to stone and gravel throughout; and is sometimes full of ferrigineous particles. Happily for this country, there is abundance of fine springs; and there are three rivers which make it more productive, than any other province in the Venetian state. These are the Mela, Chiese, and Oglio; the last of which runs for more than fifty miles through the Valcamonica, and is as famous for the fertilizing quality of its mud, as the Adda itself. The plain of Bergamo is divided into three parts; betweeen the Oglio and Serio; the Serio and Bremba; and the Bremba and Adda; so that it is no wonder that floating is universal. That part of the plain between the two last rivers, called the *Isola*, is not naturally so fertile as the others, but the produce is much more considerable. It has twelve communities, or parishes, that vie with one another in carrying cultivation to its greatest height; they reject entirely the plough, and do every thing with the spade; and esteem five acres sufficient maintenance for four persons, taking in all their expenses whatever; the whole exhibited a sight more truly pleasing, than all the pompous pageantry in churches and places. The rivers and streams in the Veronese are not so much used for the flooding of corn-lands and pastures, as in other parts of the state of the Venice; but rice has been long cultivated in this province. It was introduced in the year 1522, much about the same time as in the Milanese, and other parts of Lombardy, where all the plantations are made in the lowest part of vallies, that they may be more easily overflood.

That the difference of produce in Lombardy arises chiefly from the difference of water, appears very remarkably in the Bolognese. The Reno comes from a branch of the Appennies, which has not been forced to give way to cultivation; and collecting a quantity of fruitful earth in its passage down the hills, so enriches the plain, that the corn-lands never fail to render from ten to twelve bushels for one, whenever the water can be conveyed in proper seasons. The savana is of admirable use for the dying of silk and wool; but gives very little assistance to vegetation; the Idici is still worse; and the rivulets, which wash this plain in great plenty, are of very inconsiderable advantage, on account of the rawness of their water; insomuch, that the whole plain, at an average, does not produce more than four for one. Bologna was called with propriety *la grassa*, or the *fat*, before the Reno was diverted from its channel; for it destroyed a third part of the plain in proportion to its extent, and one-half of it at least in proportion to its goodness; but surely it is to be wondered, that the modern voyage-writers should pace so servilely in the trammels of the earlier ones, as to give Bologna the same denomination, notwithstanding she has lost so fertile a part of her territory.

From Bologna to Tortona we meet with constant irrigations; but they will not enable the farmers to mow the meadows but thrice; and unless the lands are manured, after they are flooded, they will yield but two crops of hay. On the contrary, there are generally five crops in the neighborhood of Milan, and in the province of Lodi, where the meadows are watered every eight days during the summer, if it should be found necessary. The meadows in the dutchy of Parma, how much soever extolled, do not yield above half, when compared with those in the Milanese; the reason of which may be easily investigated. The snow that comes from the mountains of the Swiss and the Grisons does not begin to melt before June, and continues to melt in July and August, which gives an opportunity to water the lands on the north side of the Po as late as September, the rivers and lakes of this country being high till this time; whereas the snow that comes from the Appennines on the south side of the Po begins to melt in May, and very little of it remains in the latter part of June; in consequence of which, there is not a sufficient supply of water for the lands in the dutchies of Modena and Parma, at the end of the summer. This has not escaped the observation of the great poet and philosopher.*

Si come neve tra le vive travi,
Per lo dosso d' Italia si congela,
Soffiata e stretta dalli venti schiavi,
Poi liquefatta in se stessa trapela,
Pur che la terra, che perde ombra, spiri,
Si che par fuoco fonder la candela.

One would be tempted to imagine, at first sight, that nature had been so unkind to the teritories of Genoa, as to make them incapable of cultivation; however, it is certain, that the industry of the inhabitants has supplied this defect. We see hills almost perpendicular, covered with olives and vines, which are supported by stones placed in several lines in the form of a wall. When the rains fall from these hills, they carry along with them moulds of an excellent quality, which running into the rivers, fertilize the vales to an astonishing degree.

The Lucquese and Tuscans have left no art untried to profit by irrigations. The Pope's subjects are undoubtedly deficient in them. I remember to have seen a few meadows in the Appennines, on the banks of the Chienti and Potenza, that had been floated; but nineteen parts out of twenty had been neglected; especially a very beautiful plain between Case Nuove and Foligno. From Naples as far as Reggio, the lands are flooded where an opportunity offers itself; and, indeed, neither the cotton-plant, nor maize, nor corn, could arrive at any perfection in that sultry climate, without the assistance of this art, which may be looked upon as the most capital branch of husbandry in Italy; but more particularly in Lombardy, where it is reduced to a regular system.

III. I shall consider, in the last place, how far the want of good water affects agriculture in several parts of Italy; and, instead of dwelling upon minute circumstances, which it would be tedious to mention, I shall mark out a few places that struggle more peculiarly with this disadvantage.

The province of Istria affords us a melancholy example; of which a great part is dry, barren, and inhospitable. From Montona to Pola, not a single spring is to be seen. The inhabitants of S. Vicenzo and Dignano avail themselves of cisterns which have been built for the reception of rain; but the poor shepherds and husbandmen have no other water to drink, but what is taken out of ponds or lakes, which ought more properly to be called marshes. The general face of this part of Istria shows the visible marks of earthquakes, or volcanoes. Sometimes we cross immense and deep ravines, which are entirely dry; for the rivers that used to wash them have been stopped in their course, and have forced a passage into other places; forming a variety of lakes, which, having no outlets, corrupt all the air in the adjacent country.* Sometimes we pass over huge heaps of mountains, which submit to no culture or improvement; and yield no other profit, but what arises from quarries of stone, whence Venice has received materials for building from very early times. The road also leads us through a few narrow vallies, which are naturally fertile; but even these have been left to run wild, for want of a sufficient number of hands to cultivate them; the contrary of which may be seen in those parts of Istria that are tolerably well watered; where the farmers are not inferior to the rest of the Italians, either in skill, or industry.

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* Daute Purgat. cant. xxx.

A similar instance of the effects of bad water may be observed in the Maremma of Sienna; a province formerly so fruitful and populous, that, according to Livy, it furnished Rome with a large quantity of corn in the second Punic war;* but it now lies waste and unpeopled. It is intersected by many rivers, which, instead of conforming themselves to the windings of the valley, burst out on all sides; and occasion such frequent inundations, that the vast uneven plain is almost become a continued morass; and, what is still more calamitous, it is from this that the bulk of the peasants are supplied with water. It is true, that there are a few who have wells; but little advantage is to be derived from them; for, as the water lies lower than the sea, and as no care has been taken to prevent a communication, it is of course brackish and unwholesome. We see every where dispersed immense fragments of cisterns and aqueducts, which, at the same time that they attest the splendor and public spirit of the Etruscans and Romans, remind us of the negligence and degeneracy of their successors.

It would be difficult to point out any part of Italy, more thinly inhabited, or less productive, than the Dutchy of Ferrara, in proportion to the depth and richness of its soil; whence many writers have inferred, that the rigor of the Papal government has depopulated the country; but this is a speculation wholly imaginary; for it might easily be proved, that there is not a conquered province in the Pope's dominions, nor even in Italy, more gently taxed, than this Dutchy. But though there be no ground to complain of severe impositions, it is certain, that it labors under a multiplicity of difficulties; among which, the want of good water is not the least considerable. Those who live near the Po, or at a moderate distance from it, filter carefully that water, and render it not unpalatable; but most of the peasants have no other for common use, but what is drawn from wells, which they find as pernicious to themselves, and to their cattle, as what is taken out of the very ditches; and, if they attempt to dig the well a little deeper than usual, they never fail to come to salt-water. There is no doubt, but that this inconvenience would be removed, if wells or cisterns, for the reception of rain, were made after the manner of those of Venice; which are so admirably contrived, as to afford very sweet and wholesome water, although they lie deep in the sea; but the truth is, many Italian gentlemen are so scandalously parsimonious, that they grudge the least expense of this nature; which obliges the peasants to drink whatever is nearest at hand, whether from rivers, or lakes, or marshes.

I shall finish my remarks with observing, that the want of good water prevails more or less through the whole *district of Rome;* which, in its proper and legal sense, comprehends forty miles on every side about the capital.* Every one knows what a desolation the plague made in the thirteenth and fourteenth centuries. The Popes removed the seat of government to Avignon, where they resided above seventy years; and when Gregory the XIth came to Rome, he found it so miserably depopulated, that the number of inhabitants did not exceed 33,000. During the absence of the Popes, the Colonnas' and Orsinis', in their turns, carried by assault both the city and its environs; which suffered more at that time from the Italians, than from the northern nations in the fifth and sixth centuries. The wretched husbandmen were forced to abandon their houses, and the tillage of their farms; so that the country about Rome was overrun with woods and thickets, and poisened by noxious marshes, resembling, for the most part, what is now to be seen between Ostia and Nettuno. In this season of public distraction, almost all the useful arts were extinguished. The wells and cisterns, and those noble remains of magnificence, the aqueducts, were involved in the general ruin; and the popes, who have had the vanity to inscribe their names upon so many useless edifices, have never thought fit to repair the water-works in the country, in which every individual had an interest. We learn from Frontinus, who has written the most accurately upon this subject, that there were three aqueducts in Rome, during the times of the republic; and that four were added in the reign of Augustus; so that Rome was then plentifully supplied with water; and we may gather from the accounts of antiquity, that numberless little streams were conducted from these aqueducts to supply the villages. Indeed Augustus was so attentive to this important concern, that he is reported to have brought into Rome the Aqua Alseatina, which was of a bad quality, for the use of the Naumachiæ; that the people should not be deprived of the least quantity of water that was reputed more wholesome.† In succeeding ages, the number of aqueducts was considerably increased. The splendid appearance of fountains in modern Rome has led many to imagine, that few cities in the world are better furnished with good water; but the reverse of this observation seems to be true. The city is supplied but by three aqueducts, two of which are modern. The water which comes from the Lago Bracciano to S. Pietro Montorio has a very offensive taste; and the Acqua Felice of Sixtus V. though generally preferred to it, can scarcely be said to be of a better quality. The Acqua Vergine, brought from the Sabina by Agrippa, is the only water conveyed by an ancient aqueduct; and that this is entire, is owing to the circumstance of its being almost wholly under ground.* This seems to be the only wholesome water in Rome; and such as prefer good water to good air, choose to live in this quarter of the city, notwithstanding its low situation. Since then there remains but one ancient aqueduct in Rome, it is less strange, that the aqueducts in the country have lain totally neglected; and, as the expense in repairing them is too considerable for private persons, it has obliged many to seek habitations in other parts. It cannot be denied, that the principal towns in the *district* are supplied with a sufficient quantity of fountains; but the thinly-scattered people, who inhabit the miserable hovels in the country, are destitute of this advantage; they have, for the most part, neither springs nor cisterns, nor even wells; but are obliged to fetch the water for all uses whatever from stagnated pools, which occasions such distempers as are common to places in a similar situation. We may add to this, that the cattle cannot subsist there during the summer, without the utmost hazard; and that it is usual for them to die very fast in a dry winter; a misfortune which befalls even the sheep, as the shepherds have assured me: and it is well known, that, in harvest-time, the reapers frequently pay more for water than for wine, as the former is so scarce, and sometimes brought from a greater distance. Upon the whole, the want of good water will suggest naturally a reason for the desolated state of the *districts of Rome;* though it is certain, that this is chiefly to be attributed to the abuse of the chamber of corn, which will be the subject of a future paper.

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* Sir William Hamilton's observations upon the late dreadful calamity in Calabria, seem to put this beyond a doubt.

* Lib. iv. c. 52.

* Almost all the voyage-writers, speaking of the neighborhood of Rome, call it the Campagna; either not knowing, or not reflecting, that the *Campagna di Roma* takes in only the boundaries of ancient Latium.

† See Frontinus, l. ii. §. 11. de aquæductibus urbis Romæ "ne quid salubrioribus aquis detraherent."

J. S.

REMEDY FOR THE GLANDERS AND BLIND STAGGERS IN HORSES. EFFECTUAL REMEDY FOR WORMS IN CHILDREN.

For the Farmers' Register.

Madison co., Va., April 17th, 1838.

Seeing in one of the numbers of the Farmers' Register an account of a fatal disease prevailing among the horses in some of the lower countries, which I suppose to be the glanders, or blind staggers, from the manner in which they are affected; I am induced to communicate to my brother farmers, through your valuable paper, a remedy that I have never known to fail, effecting a cure if practiced in time. Whether the glanders, and what is called blind staggers, is the same disease or not, they are certainly nearly allied. The head is the seat of the disease in both cases; it commences with violent inflammation of the head, and soon matter forms in the glands between the nostril and brain. The disease prevailed in this neighborhood some twenty years ago. The first horse I had ever seen with the disease belonged to my father, who had lost several previous to the one then sick; the horse was then on his broadside, and was given up as a hopeless case. I had heard that boring into the scull with a gimlet would relieve them. I procured a large ten penny gimlet, and just between the eyes of the horse I bored in about three inches. This gave vent to the matter which had formed in the glands, the horse appeared to be relieved from pain, and by introducing a probe for a day or two, the horse was upon his feet and feeding, and in a few weeks was entirely restored, and was a serviceable horse for some years. The next case was a riding horse of my own. Such was the violence of the pain, that he would thrust his head against the side of the stable and bear with his weight for a minute, then stagger about until he became too weak to stand. I then proceeded to bore with a ten-penny gimlet as described in the other case, and in a few weeks the horse was well.

Whilst I have my pen in my hand I will give you another fact which may profit some of your readers; I took charge of my estate twenty-seven years ago, having from that time until now from thirty to sixty in family, and within that time have not lost one child under twelve years (either black or white) with the exception of one a few hours after its birth, and I attribute it principally to the following remedy, which keeps them free from worms: Take the fat of old bacon sliced and fried in a pan, until the essence is all out of it, take out the rind first, then put as much worm seed as is necessary (vulgarly called Jerusalem oak,) as much sugar or molasses as will make it palitable, give it three mornings in succession. The children will eat it freely, some you will have to restrain from eating too much. Incredible as it may appear, I have known as many as one hundred and twenty or thirty large worms come from a child of three or four years old. I usually give the medicine spring and fall. I am satisfied that if the above remedy was more practiced in families, that it would be the means of preserving the lives of many children, for if worms are not the immediate cause of disease with children, they greatly aggravate disease of any other character.

J. F. C.

EXPENSE AND NET POFITS OF M. AMANS CARRIER'S WHITE MULBERRY PLANTATIONS.

For the Farmers' Register.

The readers of the Farmers' Register have already had submitted to them translations of the fourth, fifth, and sixth letters of M. Amans Carrier to M. Bonafous, which presented the highly interesting details of his practical operations in rearing silk-worms, and the estimates of expenses and profits. There still remained another, the seventh letter, concerning his mulbery planting, and written in the same manner of minute detail, the length of which forbids its being given here in full; and the more as the kind of tree treated of (the *morus alba* or white mulberry,) will never be chosen for cultivation in this country, now that the greatly superior value of the morus multicaulis is so well established; and consequently the postponement of returns, no more than the heavy and unusual labors of M. Carrier, will never have to be encountered by any new beginner in this country. But though the details of the experience of the writer in mulberry culture, for this reason, would convey but little instruction, as precepts or practical directions to culturists here, still, though indirectly, his statements are highly instructing as well as interesting. M. Bonafous requested this account from his correspondent, doubtless because of the unusual cost of the plantation, and because the items of expense had been so accurately noted. And if the facts exhibited serve to prove to those, in France, who might be forced to incur such heavy expenditures, that the profits would yet greatly surpass the cost, then still higher profits do those same facts indirectly offer to American planters, who can obtain as large products in less than one-fourth of the time, or at less than one-fourth of the cost in money, time, and labor combined. It is principally with the view of impressing this unavoidable inference, and the important though indirect instruction which it conveys to American culturists, that we now shall condense, and offer to the readers of the Farmers' Register, the more important parts of this long French article, accompanied by our own remarks on the whole.

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*Minus injuriæ subjacent subterranea, nec gelicidis, nec caloribus exposita. Frontin. l. 1. §. 121.

It should be premised that, on account of the manner in which silk-culture is generally conducted in Europe, M. Carrier's estimates of cost and profit, (which have already been, or are now to be exhibited,) could well be, and doubtless were, made with much precision and correctness. In that country, it is most usually the case, that the mulberry leaves are bought from the owner of the trees by another person who owns and feeds the silkworms. Thus, the market price of leaves, for every day and year, is as well known in France, as the prices of grain or hay in this country. Add to this that the quantities of leaves furnished by particular trees, or plantations, must be ascertained every year, because sold by weight, and there can be left but small room for error in estimating in advance the products of any known lot of trees. Therefore, when, in his preceding letters, M. Carrier charged his silk with the value of the leaves used for feeding, and when he estimates (in the letter now under consideration,) the money price of the products of his trees, there is no ground for uncertainty, except so far as he may have erred in estimating the quantities of leaves produced by trees of certain degrees of size and vigor; and even in this, he could not err greatly, having as guides the general estimates and long experience of the growers of France and Italy.

There is another important lesson which the American culturist may learn from this account. This is the fact which may be inferred—and which would at first seem incredible to those who have made no estimate—that a plantation of white mulberry trees, though the two-year old grafted stocks may be bought at 12 to 15 cents, costs more in France than a multicaulis plantation would cost here, even if trees of equal size had been bought at $1.50 each, which was about the price last winter. Startling as may be this assertion, its truth will be made manifest to any one who will calculate the product of any certain sum, (whether $10 or $1000,) laid out in both kinds, and the stock of each propagated and nursed in the most approved and usual manner for each, for the 8 years' time, which must elapse before the white mulberry trees are fit for use. Cost in time and labor alone may be as heavy as any amount of price in money; and the price of multicaulis trees, extravagant as it was in this country, could not amount to as much as the great labor and long postponed returns of M. Carrier's white mulberry trees. If his plantings had been of the former instead of the latter kind, he might have gathered the leaves on the second year, and have had the benefit of six years' crops, before he ventured to take the first from his white mulberry trees. This is in addition to all the superiority of value, and greater facility in gathering the leaves of the morus multicaulis, compared to the morus alba, even when the plantations of both have reached their most productive state. But it is proper to suspend further remark and comparison, until M. Carrier's facts and estimates are presented.

Sanguine as was this experimenter, when commencing silk culture in the almost untried region of Aveyron, and zealous as he proved himself, in the prosecution of his successive trials, he nevertheless proceeded at first with hesitation and much caution. He then stood on similar ground to that of many persons in this country who have believed that silk culture would be profitable here, but whose confidence was not so entire as to make them throw aside all doubts and fears, and boldly to commence the business. His progress, therefore, was slow.

His first attempt was made in 1819, when every thing was new, and every requisite was wanting. Besides losing a considerable number, he saved 166 lbs. of cocoons of very good quality, which were sold for 319 francs. The total expense was 282 francs leaving 37 of clear profit. This small result was satisfactory, under the existing circumstances of disadvantage. All the expenses had been extraordinary, because of the newness of the business; and the leaves consumed cost the very high price of 8½ francs the quintal (or 100 lbs.)

In 1820, he obtained 92 lbs. of cocoons from the ounce of eggs, and 87 lbs. in 1821; which last product, small as it is, compared to such as ought to be reached, is yet, says M. Carrier, "superior to that obtained habitually in the countries where this industry prospers."

In these trials, he had been governed by the usual and long established practices of the south of France. Afterwards he discarded whatever seemed unsupported by reason, and relied upon the lights furnished by the writings of Dandolo and other enlightened silk-culturists. With these better guides, and especially by pursuing Dandolo's method as nearly as circumstances permitted, in 1822, his product, from 3 oz. of eggs, rose to 107 lbs. of cocoons to the ounce. "I have since," adds M. Carrier, "conducted rearings every year, which have always approached, and often surpassed 100 lbs. of cocoons from the ounce of eggs; but that exceeded all, as it yielded, from 7½ oz. of eggs, nearly 10 quintals of cocoons, or a little more than 123 lbs. to the ounce of eggs." It was of this crop that the interesting details were given at length in the previous pages of the Farmers Register.

"When once persuaded," continues M. Carrier, "by facts so constant that the rearing of silk-worms would succeed admirably at Rodez, it was time to think of planting mulberries. However, I proceeded with so much timidity and caution, that I planted only 20 trees in 1822, and 138 in 1823." His countrymen had no faith even that mulberry trees would succeed in that region, when subjected to be annually stripped of their leaves; and though a few fine and large trees were standing here and there, their vigor was attributed to their exemption from being robbed of their leaves. It was M. Carrier's main object to convince his countrymen of their ability to profit by silk culture, and to induce their making the trial; and to effect this, it was necessary that he should begin at the beginning, and perform every thing, and to present facts in contradiction to all existing objections founded on prejudice. Hence, as well as for his own profit, the commencement of the plantation which is the subject of his seventh letter, and also the regular accounts kept of all the items of expense.

The place for the planting was near Marcillac, on a soil among the worst for its barrenness and unfitness for cultivation, in consequence of being full of stones; and was selected by its proprietor because it had previously brought in no profit whatever, and therefore its occupation, or loss, would cost nothing. Its only redeeming quality, (though M. Carrier seems to have attached no importance to the circumstance,) was that the soil was *calcareous;* and most probably excessively so, as it was also very poor. It was probably a *chalky* soil, though that is not stated. In addition to his own interest directing the choice of this stony, unproductive and worthless land, he had another object. In applying so rebellious a soil to this purpose, if he succeeded, it would silence every objection, and remove every doubt of success, on better lands.

The ground to be planted amounted to 4 hectares, or nearly 10 American acres. The surface soil was but of little depth, and so light that in summer its particles were carried off in dust, by high winds, as from public roads. Some dwarfish oaks and mean walnuts were scattered here and there, and many plum trees intermixed with briers. These were all the vegetable riches of the land. In one part was a small piece of flax-ground, which was very good, its use and product having long been the perquisite of the vine-dresser, who had improved, manured, and tilled it well. Such were the several parts of the intended plantation of mulberry trees.

The land was full of stones, both upon and beneath the surface. The flax-ground, it is true, had been cleaned of them to a good depth; but the stones thus taken off had been thrown on the other adjoining land, and now served to increase the quantity there requiring removal. Half of the earliest planting, of 50 trees, was in the flax-ground, the only good part of the lot; the other half in the worst—all the remainder being alike the worst. Every care was used in the planting, and some manure given to every tree. Contrary to expectation, those in the flax-ground suffered much under the drought of the next summer, while the the trees in the land full of stones withstood it, much better. This induced, in all the subsequent plantings, the stones, which were necessarily taken up, to be replaced in part, instead of being carried off the land. Thus the mode of planting and disposing of the stones was varied more than once; but in every mode the labor was prodigious. It is unnecessary to describe the several operations, as the estimates of expense will be given in full. But, one process (for the planting of 1830) will be stated, as a specimen, and also because this mode was the most approved, and deemed the cheapest effectual preparation.

Strips of 12 feet wide were marked off across the ground for every intended row, and opened, and all the loose stones, as well as the more scanty quantity of earth, taken out, down to the fixed, stones *(jusqu'au ferme.)* The stone and earth were laid separately on the borders of the wide trench thus opened. Some of the stones were then put back first, so as to form the bottom layer, but not so close as to prevent earth settling into the interstices, and the roots of the young trees passing through. When stones of suitable size were not plenty enough for this lower bed, others were added from the old heaps made by clearing them formerly from the flax-ground. And all those dug up of sufficient size and proper shape for the stone wall, were carried for that purpose to the line surrounding the lot, where the wall was to be built. At every stake showing where a tree was to be afterwards planted, a sufficient space (5 or 6 feet across,) was kept free from the replaced stones, so that none should need removal at the time for planting. The trenches were finished in the autumn of 1829. The extent of land prepared so laboriously measured 100 toises in length, and 8 toises in breadth. The quantity of stones remaining, after all the replacing in the trenches, was estimated at 150 tumbril loads, which were all carried without the lot. The earth which had been dug out, served to fill the holes left for the trees, after their being set out—to fill the interstices between the stones—and also to furnish a covering layer of 5 or 6 inches thick. The young trees, when set out, in the places left for them, had some earth and also manure filled in among and over their roots, then a layer of 6 inches of earth, and on that was placed a sort of pavement of flat stones laid in contact, but not closely jointed. Earth was then laid on, to the original level of the surface of the ground.

All the trees were set at 15 feet square, a distance unusually small in France. The growth of all except those on the flax-ground was very good. M. Carrier states the condition of each year's planting; and when, in their turn, describing the 297 trees set out in the autumn of 1826, he says that they would yield the next season, (1837,) which would be the 11th from the setting out, 40 lbs. of leaves each, on the average; and he ascribes their very good condition (*"tres satisfaisant,"*) to the circumstance of not having had their leaves plucked until they were 8 years old. That is, we infer, 8 years from his planting; which would be at least 9 from the grafting, if not 10; and certainly 10, more probably 11, and perhaps 12 years, from the coming up of the stocks from the seed.

What would American culturists think of such expensive labors as the above described, and that merely preparatory for mulberry and silk culture, and from which no returns are to be obtained until after a growth of at least 5, and the better if 6, 7, and even 8 years after the planting? Nevertheless, the accounts of cost and products, which will be exhibited, show clearly that even this unusual and enormous outlay would not only be reimbursed, but would leave a very large net profit.

Passing over the operations of the successive annual plantings, and other details, we proceed to the statements of expenses and profits. It will be given in M. Carrier's own figures, and an exact, though somewhat condensed version of his own words.

"1825.—*Expense of planting* 50 *mulberry trees.*

	Francs. Centimes
50 detached pits, or holes, dug at 25 centimes - - - -	12.50*
50 mulberry trees bought at 75 c.	37.50
Manure for 50 trees, at 60 c.	30.
5 days' work in planting, at 1 f. 75 c.	7.50
	87.50

Cost per tree, 1 franc 75 centimes.

"1826.—*Expense of* 297 *mulberry trees planted.*

Digging 297 holes, at 25 c. - -	74.25
297 trees at 75 centimes - -	222.75
Removal of stones dug up; 24 days' work, at 1.50 - - - -	36.
Bringing earth from without the lot, to fill the vacancies left in the holes, by the removal of the stones; 19 days' work at 1.50 -	28.50
Manure for 297 trees, at 40 centimes	118.80
26 days' work in planting, at 1.50,	39.
	519.30

Cost per tree, 1 franc, 75 centimes.

"1830.—*Expense of* 120 *mulberry trees planted.*

Preparation of 3360 square metres of land, whether in moving the earth, forming the bed of stones, carrying off the superabundant stones, or bringing from without the earth that was deficient; 137 days' work, at 1 f. 50 c. - -	205.50
120 mulberrry trees, at 75 c. - -	90.
13 days' work in planting - -	19.50
	315.

Cost per tree, 2 f. 62½ c.

"1833.—*Expense of* 270 *trees planted.*

Opening 9 trenches, each of 150 metres in length, and preparation of the intervals between the trees; 209 days' work, at 1 f. 50 c. -	313.50
9 days' work of tumbril, in carrying away the useless stones, at 5 f.	45.
270 trees at 75 c. - - -	202.50
7 days' work of a woman, to gather moss, (for manure,) at 1 f. -	7.
31 days' work for the plantation, at 1.50 - - - - -	46.50
	614.50

Cost per tree, 2 fr. 27½ c.

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* The franc is equal to 18¾ cents, and the centime is the hundredth part of a franc.

"1834.—36 *mulberry trees planted.*

5 days' work for the plantation, at 1 fr. 50 c. - - - - - -	7.50
36 mulberry trees at 75 c. - - -	27.
3 days' work, at 4.50 - - - -	4.50
	39.
Cost per tree, 1. fr. 8 c.	
60 trees, in the vineyard, have been planted at different times, and at almost no expense; it will be sufficient to charge them, including the cost of the tree, at 1 franc each, at - - - - - -	60.
The expense of the surrounding stone wall, 1040 metres long, and 1 metre high, ought to be charged to the plantation; but only half the entire expense, as the wall encloses as much of other ground, occupied by the garden, house and dependencies; let the share of cost then be, 520 metres of wall (one half of the whole) at 62½ centimes, - - - - - -	325.
Total of all expenses incurred	1960.30

"To this sum should be added the price of the preparation of two parts not yet planted, and which it is easy to estimate. They will probably cost 330 francs; let us suppose 400, and the total expense will be 2360 f. 30 c. But to cover any minor expenses which possibly may have been passed over, or which may be necessary hereafter, I adopt the round sum of 2500 francs, or 3 fr. for each mulberry tree planted. In this calculation, I allow nothing for rent, because the land before yielded none.

"Let us see now what are the actual products, and those which may be safely expected in a short time, estimating the leaves or only 4 francs the quintal (100 lbs.) whilst the average price for the last twenty years in the Cévennes has been 5 francs.

"*Probable quantity of leaves to be gathered next spring*, (1837.)

25 trees planted in leaves,	1825,	at 60 lbs. of	1,500
297	1826	40 -	11,880
80 only in	1830	30 -	2,400
			15,780

"These trees having been planted at different epochs, I will suppose them, to render my calculation more intelligible, all of the age of eight years at the actual moment. This fiction appears to me quite admissible.

"I shall have then, on the eighth year, 157 quintals of leaves, which at the price of 4 francs, will yield 628 francs; that is to say, an income of rather more than 25 per cent. upon the 2500 francs of expense. In four years more, the trees of all the plantings may be gathered from; and at that time I assign to them a very low product, in supposing it to be 40 lbs. for each tree. The whole number, 833 trees, will furnish 333 quintals and 20 lbs. of leaves. Drop the excess, and suppose only 300 quintals, which at 4 francs would be worth 1200 francs; and this, on the twelvth year, would be a revenue approaching 50 per cent. upon the capital expended.

"Let us come by supposition, to 1845, and value the property after 18 years of existence. We shall find, without question, if the trees continue to receive proper attention, that the crop will be 80 lbs. per tree, and for the 833 trees, 666 quintals. Dropping the 66 quintals, the remaining 600, at 4 francs, will bring 2400 f. or 100 per cent. on the capital.

"I will push no further the calculation of probabilities; I give it up, with confidence, to the investigation of the best informed men of all countries; and I pronounce that they will find my statements of profit below the truth. In this exhibit may be seen the secret of the riches of the countries which have known how to appropriate to themselves this valuable culture.

"The advantages of these plantations do not stop here; then follow the profits both of rearing the silk-worms, and of reeling the silk, which in many cases may double the sum of the products. But these are separate and distinct branches of industry, and of which I have already presented the estimates in one of my last letters."*

The writer adds, that in estimating products, he had stated them at only three-fourths of the supposed amount in common years, that the omitted fourth might serve as an abundant offset against losses from bad seasons. He presumes that the allowance thus made is most ample; as indeed it would permit a total loss of the crop, from late spring frosts, or other causes, once in every four years.

There is however one apparent, and another real omission, in the above charges. The first is, that nothing is charged for cultivation. No doubt there was good reason for this omission, though none is mentioned. Perhaps some other crops were raised in the intervals between the trees, which fully paid for the cost of the cultivation. The cultivation of other crops in mulberry grounds is general in France, even after the trees reach their full growth; and for that purpose, they are planted very wide apart. M. Carrier planted closer, that his trees might occupy the whole ground, after being well advanced in growth. But still, at 15 feet distance, they would not forbid other tillage before the trees were 8 years old.

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* Translated for, and published in the Farmers' Register; See pp. 94 to 96, of vol. vii.

The other omission is of the interest properly chargeable upon the outlay. However, let this charge be added, and the balance of profit would still be large.

We have now presented M. Carrier's estimates of the cost and profit of white mulberry (*morus alba*) culture in France, the trees being of the kind then deemed the best, and which are still the kind in general use there. It would be a very interesting and valuable addition to this article, if there could be presented a comparative arithmetical and correct estimate of the cost and profit of cultivating the *morus multicaulis* in this country, not for sale, but for use. We know not as yet the amount of product of this tree, and therefore will not presume to attempt such an estimate, or to seek aid for our argument in *exact* calculation. Still, even if using *unknown quantities*, there will be left no question or doubt of the immense superiority of advantage which the American silk-grower would have in possessing this variety of mulberry, even supposing him to have purchased his first and a sufficient stock at the highest prices, or that he had paid $1.50 for trees of such sizes as M. Carrier bought at 75 centimes, or 14 cents. The recent unheard of appreciation of the *morus multicaulis* being necessarily temporary and transient, it ought not to be brought to bear on such an estimate; but yet it will be allowed its utmost effect, to obviate any possible objection to the results on that score, and also that no ground may be left for an argument in favor of delaying a commencement of planting, because of the high price of the trees. The choice between paying the highest price, for trees to plant in the spring of 1839, or to wait two years, and then buying them as cheap as white mulberry trees are in France, is altogether a matter of calculation; and the difference may be estimated on very sure grounds. He who waits two years may perhaps buy his trees at ten cents each; but if he had laid out the same money last winter in plants, and were to cultivate and increase the stock for the two years, the increase would be so great as to reduce the average cost to still less than ten cents, besides the furnishing of a crop of leaves the second year.[*]

To establish, then, what was asserted above, the greater cheapness and profit of mulberry culture in this country, we require but the three following postulates; 1st, the correctness of M. Carrier's estimates, even to extent of *half* the net profit which he makes out; 2nd, that the *morus multicaulis*, at 8 years after the planting, and set seven-fold more thickly on the land, will yield as many pounds of leaves *per acre* as the white mulberry of the same age; 3rd, that the profit of 100 lbs. of the former, in feeding silk-worms here, will not be less than that of an equal quantity of the leaves of the white mulberry fed, or sold for feeding, in France. Then, taking M. Carrier's rates of charges for French culture, the comparison at the end of eight years will stand thus:

The European culturist of *morus alba*—	The American culturist of *morus multicaulis*—
Will have paid as much for rent of land, for 8 years, as would purchase twice over the fee-simple of as good land in America—	Will have paid so little for land, that, if the different mode of procedure should require even twice the quantity, (to have abundant products, and to keep up the stock by new and successive plantings,) such addidition of expense will be of but small account—
Paid only three-fourths of a franc (14 cents) per tree which, set at 15 French feet square, make 169 to the Am. acre; and for 20 acres would be 3380 trees, costing $474—	Paid $1.50 for 316 trees, making same amount of purchase money, $474; which by roots and cuttings, would give 9796 trees the first year—and an amount exceeding, by an enormous surplus, all his demand on the second year for completing the 20 acres.
Will have gathered one crop of leaves only—	Will have gathered seven crops of leaves—
Employs high priced labor to gather leaves of small size from tall trees, and which must be plucked carefully to guard against destroying the trees—	Employs high-priced labor (in general, but not in Virginia) to gather large leaves, from shrubs requiring not one-fourth as much labor as in the other case—
Feeds silk-worms, with cheap labor, in a bad climate for silk culture.	Feeds silk-worms with high-priced labor (in general, but low enough in Virginia,) in one of the best climates in the world for the product.

Let the reader judge deliberately and fairly of the comparison made either in this or in any other mode that may be preferred—and let it be extended to any other particulars, and prices be affixed, if the precision of arithmetic and of known qantities be desired—and we have no question but that the results will always show less outlay, and more profit in the United States, and more especially in Virginia, than any where in the silk region of western Europe.[*]

EXPERIMENTS ON MANURES, &c.

From the Transactions of the Essex (Mass.) Agricultural Society.

The Committee *Report:* That they consider the subject of the making and application of manures, one of the greatest importance to the agricultural interests. Manure and labor are to the farmer, what capital and credit are to the merchant. With them well applied, the one will add barn to barn, the other store house to store house, till there shall be no room to contain their several wealth; without them, they must soon suspend operations, and their farms and their ships pass into the hands of more skilful and industrious owners.

Many farmers think they cannot afford to purchase manure, and the price *does* seem disproportioned to the immediate profits; but no farmer will say that he cannot afford to make the most of what he has, and to apply it to the best advantage. Many take an honest pride in being able to say, I have raised so many hundred bushels of corn, or so many tons of hay; now to be able to say I have made five hundred loads of manure, is just as much a matter of boasting, for manure will make corn, and hay, and other valuable products, if it be only judiciously applied. Put in the seed and the manure, and the grateful soil will make you a liberal return. It is held to be true by experienced farmers, that he who doubles the expense of labor and manure, will increase his profits and products in nearly a four-fold proportion. In other words, the man who spends half his time upon his farm, and skims over one hundred acres of land and gleans from it fifty bushels of corn and twenty tons of hay, if he should devote his whole energies to his farm, and improve his means of making manure, might raise nearly two hundred bushels of corn and eighty tons of hay.

Some have, in their natural situation and proximity to the sea-board, greater facilities for making and obtaining manure; but every substance of animal and vegetable matter can be mixed with the soil in such a manner as to increase the fertility of the earth; and even the different soils may be mingled so as to produce the same effect.

The quantity of manure a farmer uses, is a pretty fair criterion by which to judge his character. In Plymouth county, where a premium is rewarded to the man who makes the greatest number of loads, a most worthy and truly respectable farmer, the last year, reached the very enviable eminence of seven hundred and ninety-eight loads; the lowest competitor claimed for three hundred and fifty loads, and his must be allowed to be an *improving* character. William Clark, jr. of Northampton, in his statement to the Hampshire, Franklin and Hampden Agricultural Society, represents that he keeps an average stock of eight swine, three horses, and eight oxen and cows; from this stock, with the skilful use of all his advantages, which are not superior to those of many of our farmers, he made from June 1837 to June 1838, nine hundred and twenty loads, an honorable monument to his intelligence and industry, which compensates in utility and solid value for what it may want in taste and splendor. Mr. Clark used for compost, three hundred loads of sods and soil and two hundred and forty-seven loads of swamp muck. His yards were supplied with corn-stalks and refuse hay during the winter, and brakes and weeds in the summer, and cleared out twice during the year. It might be supposed that manure so made could possess but little of the quickening and strengthening principles; but those who have visited his farm and seen his fields burdened with their heavy crops, are satisfied that Mr. Clark knows how to make manure and to apply it, and that his fields acknowledge their obligation and pay their due return. Mr. Clark, from such manure, has raised more than one thousand bushels of corn in a year.

The committee award to Daniel Putnam, of Danvers, for the satisfactory experiment and the full and explicit statement made by him, a premium of twenty dollars.

They recommend that Mr. Putnam's statement and the letter addressed by Joseph How, Esq. of Methuen, to the committee, be published.

For the Committee,
DANIEL P. KING.
Topsfield, Dec. 25, 1838.

Daniel Putnam's Statement.

To the Committee of the Essex Agricultural Society, on Experiments on Manures:

Gentlemen—The following account of experiments in the use of unleached *wood-ashes* as manure, is submitted, that you may make any use of it which in your judgment will render it serviceable to the farmers of the country. In the letter part of August, 1837, I broke up about one acre of low land (too low and wet to till with ease,) which had become so much bound out that it yielded not more than 14 or 15 cwt. of hay, and that little was of poor quality. After ploughing, I rolled this land, and then dressed it with 40 bushels of wood ashes, mixed with wash (mostly sand) from the road-side, making probably about one and a half cord; sowed half a peck of herds grass and 3 pecks red-top seed; then harrowed thoroughly and rolled. The seed took well. In 1838 I obtained from this piece of land 35 or 40 cwt. of very good hay, mostly herds grass.

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[*] The above estimate rests on the supposition that the 163 trees average 50 single-bud cuttings, of which 30 live and produce trees of like average size. Then 316 × 30=9480+316 (from roots)=9796 trees grown the first year. If planted at 6 feet distance both ways, or 1210 to the acre, there would be still wanting 15404 trees to fill the 20 acres. These would be supplied the second spring by the productive buds of only 514 of the youngest trees of first year's growth; leaving the tops of the remaining 14890 trees, as well as those of all the after and rapidly increasing crops, to be put to any use desired; whether it be merely to stand, for the purpose of furnishing the most abundant and earliest possible supply of food for silk-worms from the 20 acres—or to make additional plantings, for feeding worms, or for feeding cattle, to any extent whatever, The chance for selling trees is put aside, and no regard paid to it in this calculation of profit.

In November, 1834, I broke up a field, dressing it with about 4 cords of manure to the acre; on a part turning it under the sod, and the remainder putting it on the furrow. In 1835, planted with corn, the crop large; in 1836, without mowing the sod, sowed oats and hay seed. Obtained 40 bushels of oats to the acre. The hay seed took well, but in the following winter was killed by ice forming and remaining long upon the field. In 1837, obtained not more than 15 cwt. of clover to the acre. Thought I must take this field in hand again. In April, 1838, ploughed an acre and a half of it, rolled, dressed with 40 bushels of wood ashes, unmixed with any other material, to the acre; sowed oats and hay seed. The oats had a fine growth and the hay seed came up well, but (for I think it best to tell the *whole*) the rust which visited my neighbors' oats was not kept out of my field by the ashes; I mowed for fodder before the crop had ripened; there was growth enough for 40 bushels to the acre. The young grass, too, did not find the ashes a matchless sanative, for its sickness, (in the scorching weeks of August,) which a draught of pure water would have cured, proved mortal.

Shall I tell you too what virtue there is in bones? From Mr. Ward, of Roxbury, I obtained, last spring, 20 bushels ground bone (cost at Roxbury, 35 cents per bushel,) sold one bushel to a neighbor; mixed the remaining 19 bushels with about one cord of soil taken from the side of the roads in the fields where the mixture was to be used. Some of it was used in 10 or 12 days after it had been mixed, and some remained in heap five or six weeks. About the 10th of May, when planting corn where four cords of manure to the acre had, the previous autumn, been turned under the sod, and where I was putting four cords to the acre in the hill, I selected four rows through the centre of the piece, in which I put the bone mixture, at the rate of 50 bushels bone to the acre; no other manure *in the hill*. The corn here looked as well through the season as on the remainder of the piece, and ripened a little earlier. At the time of harvesting, 104 hills on bone yielded 184 lbs. of corn on the cob. The same number of hills in the adjacent rows on manure, yielded 188¾ lbs. That on the bone was the dryest at the time of weighing.

The first week in May, I planted a piece of corn, where I put three and a half cords of manure upon the furrow, and four cords in the hill, to the acre. Through the centre, I left four rows until about the 10th of May, when I planted them with bone, as in the other piece. Here, from 66 hills on bone, I obtained 90 lbs.; from 66 on manure, 96 lbs. Here, too, the corn on the bone ripened earlier, and of course weighed less.

May 21st, when planting potatoes, where 4 cords of manure to the acre had been turned under the sod the previous autumn, and where I was putting 5 cords to the acre in the hill, two rows were planted on bone, 50 bushels to the acre. This ground was furrowed only one way, and the hills on the bone happened to be put nearer to each other than those on the manure. When dug, *equal quantities of ground* were taken; of bone, 14 hills; of manure, 12 hills; the bone yielded 55 lbs.; the manure 52.

Between the 15th and 20th of May, I sowed sugar beet, in drills, 3 feet apart. In some used barn manure, 6 cords to the acre; in others muscle bed or sea marl, 5 cords; in others bone, 50 bushels. Three drills of each kind, about three rods long, yielded as follows, viz: from barn manure, 247 lbs.; muscle-bed, 355 lbs.; bone, 337½.

At the same season I sowed carrots on barn manure, muscle-bed, and bone. Barn manure, 6 cords to the acre; muscle-bed, 4; bone, 50 bushels. Some of the bone and the other manures were spread broad-cast, and a part of the bone was put in the drill; rows 14 inches apart. Two rows of each kind, three rods long, yielded as follows; barn manure, 75 lbs.; bone in drill, 105 lbs.; bone spread, 82 lbs.; muscle-bed, 88½ lbs.

I sowed with ruta baga, June 1st, 10 drills, 3 feet apart and 15 rods long; five drills on barn manure, part of it fresh from the barn cellar and part partially decomposed, 9 cords to the acre. The other five on bone, 50 bushels to the acre. Those on the bone were less eaten by the fly than the others, though the others were not very badly injured. A strip (17 feet in length) across the drills, where 5 had bone and 5 manure partially decomposed, yielded, bone, 248 lbs.; manure, 228 lbs.

Another strip, 16½ feet long, where there was bone and fresh manure, gave, bone 212 lbs.; manure, 227 lbs.

About the 10th of June I sowed ruta baga on reclaimed meadow land; drills 3 feet apart; manure 9 cords to the acre; bone 50 bushels. Soon after the plants came up, those on the barn manure were nearly all destroyed by the fly; it was necessary to sow a second time. Those on the bone were but very little injured. Four drills, two rods long, on bone, yielded 486½ lbs.; four on manure, 439 lbs.

DANIEL PUTMAN.

North Danvers, Dec. 5, 1838.

Mr. How's Letter.

Methuen. December 5, 1838.

Dear Sir.—In compliance with your request, I suggest a few ideas, on a subject of no small importance; for success in farming depends principally on the quantity of manure that is made. And, in fact, a locomotive may as well be propelled without steam, as a person have good success in farming without manure. There are various ways by which manure may be increased. Cellars under barns for the reception of manure are highly important, as its value is much increased by being preserved from drenching rains and drying winds. Also, the quantity may be much increased by hauling muck or soil, or throwing in hay, straw, or some other materials to receive and suck up the urine, as this is supposed to be worth nearly as much as the droppings. A suitable plan for a cow yard is of no small importance. It should be much hollowing in the middle; the sides so elevated as to prevent the water from the running in, consequently there will be but little to run out, to wash out the manure. A large quantity of manure may be made in such a yard, by hauling in muck, soil, or some other material, and ploughing or pitching it over occasionally. But it is said, we have no meadow from whence to get muck; there are no scrapings in the road to be collected; therefore, we have nothing to make compost of. But I would say, if they have nothing else, take the soil from the field, and with a little additional manure, the field may again be restored to its former fertility. Another object of some importance is to have the manure applied in the best manner. I have until recently been of the opinion that it is best to be applied in a green state, and have the fermentation take place in the ground; but of late I have had a different opinion, although I have tried no experiment that is satisfactory in my own mind. I would suggest the idea of recommending a premium to be offered for the best experiment on the application of manure, that it may be ascertained which is the most profitable, to apply manure in a green state or to make a compost of it by mixing other materials, taking into the account all the additional expense of labor.

Another thing is, to keep the hogs at work. By keeping a good supply of hogs, and accommodating them with materials to work with, they will add much to a farmer's stock of manure.

Some farmers are averse to the credit system; to supply their hogs with materials to work with, to fill their cow yards and barn cellars with muck, &c., and to give one, two, or three years' credit is too much. This is one important reason why so little improvement is made in farming. I believe there are the materials on almost every farm, and means within the reach of almost every farmer, to enrich his farm to almost any extent.

Suppose a person to make a certain additional quantity of manure; consequently in the same proportion the products of his farm will be increased; from which, by spending on the farm will again increase the manure, and so on, until his farm may be enriched without limit. Finally, I believe that if all the farmers would pay their attention to making manure and enriching their farms, that their interest requires, the western fever would be less prevalent among us; and our young men, instead of leaving the farms of their sires and engaging in speculation, or emigrating to the far west, would cultivate the land of their fathers, and learn from experience that they may be amply repaid for all their toil, and that the cultivation of the earth is second to no other employment. Yours, with sincere respect.

JOSEPH HOW.

COMPARATIVE VALUE OF THE WHITE AND CHINESE MULBERRY.

To the Editor of the Farmers' Register.

In the Register, Vol. vii. No. ii. you have copied from the 'Southern Agriculturist,' a letter to Dr. Joseph Johnson, dated "Paris (France) 13th September, 1837"—the following paragraph relative to the value of "morus multicaulis"' is extracted from that letter:

"*Silk-worms.*—This is a subject of deep concern to our country. Prince and others have propagated and recommended the "morus multicaulis," as the best subject for that purpose—do all you can to destroy this opinion. Noisette, who has studied the "morus" more than others, tells me there is none equal to the common white (*morus alba,*) that the "morus multicaulis" after four or five years dies, or vegetates badly. This is experience—profit by it."

This is *French* experience, let us contrast it with a little of *American* experience.

On the farm of the Potomac Silk and Agricultural Co., situated 6 miles north-east of Fredericksburg, and 4 miles west of the Potomac, there is a field of 3½ acres of "morus multicaulis," containing about 7,000 trees. The roots of twelve hundred of these trees, are now taking their fifth years growth. They have been transplanted twice on this farm—were headed down in November last, near the ground, yet, not one of them has died, and they are now throwing up stalks, much more promptly than the "morus alba" standing but a few steps distant, and which was headed down about the same time.

The "morus alba" was transplanted in the spring of 1837, the "multicaulis" in the spring of 1838. LAYTON Y. ATKINS.

Stafford co., Va., May 10th, 1839.

THE PROPERTIES OF FLOWERS.

From the London Horticultural Journal.

The advancement of floriculture has always been an object of the first importance with us. We have taken more pains with it than with any other branch of horticulture or gardening, because it would be followed with advantage by a large class, and by persons in all grades of society. The Horticultural Journal has paid great attention to the properties of flowers, with a view of teaching the amateur what is necessary to render him a successful exhibiter, and confirming the more experienced, but perhaps wavering, professional gardener in some fixed principles. It is desirable that all persons should be united upon the value of fancy flowers, and, of course, upon the standered of perfection by which such value shall be estimated. The Metropolitan Society has done more towards fixing this standard than all the horticultural and floral societies put together. The rules laid down by that society have been followed, or professed to be followed, by almost every establishment deserving the name of floral or horticultural, in the kingdom, and it has been of great service to the science. The properties of flowers were, at one time, valued by no set rules of propriety, by no consistent attribute of beauty. The whims and fancies of particular individuals pronounced particular points estimable, without considering whether such points increased the splendor of a flower; whereas the points insisted upon by the Metropolian Society, without a single exception, increased the beauty of a flower even to ordinary eyes. Thus it was that roundness and flatness in the bloom of a pansy were said to be the standard of perfection; place side by side a pansy of the old shape, and one nearly approaching the circle, unbroken through the petals, overlapping each other and tolerably flat, the most unpractised eye will see the richness of one compared with the other, and though there are none quite round or quite flat, there are many which approach both, and they are the more valuable in proportion to their near approach. Again, the properties of the dahlia are equally well defined; the nearer the shape approaches two-thirds of a ball the better. Every body can understand this definition of the property of a dahlia. It is true, that to become of this form, the petals must be broad, round ended, short, and imbricate well, free from notch, plenty of them, and the centre not over bloomed; but these are details. If the flower be two-thirds of a ball, the detail is sure to be good, for if the petals be narrow or pointed, or long, the flower cannot be well formed. A tulip has been equally as well defined as to property, and very fortunately, for the flowers which were bearing high prizes were perverting the taste of the growers; and it will take some years to correct it. Nevertheless, the rule laid down by the Metropolitan Society cannot be mistaken. The desired form, when expanded, is from one-third to one-half of a hollow ball, forming, as a matter of course, a perfectly round shallow cup; for, as the beauty of a tulip is in the inside, no other form will so well display it. The tulip must, however, possess one quality without which it will be now set down as valueless. The white or the yellow must be of one uniform shade or tint, without stain, to the very centre. In this case, as in the other, the most ordinary observer, who may know nothing about tulips, shall, nevertheless, in a moment decide the clear round flower is more beautiful than one that is stained or not round. Upon this principle should the value of all such productions be estimated. We do not mean that every body should be able to appreciate all the points of a good flower; but that the leading ones, especially the form, should be that most likely to please the world. The auricula is a flower equally requiring a proper estimation of properties, and equally indebted to the Metropolitan Society for published rules by which to regulate them. The chief point here again is *form*. To be quite round and quite flat, like a counter, would be perfection; but here the colors form a much more important feature than in other flowers, for the auricula will come all green like a calix, or all white and mealy, without any distinct color. It has been, therefore, necessary to state there should be several divisions of color; the small tube in the centre should be bright yellow—the circle round this perfectly white—the next circle should be a distinct color, lilac, violet, purple, blue, brown, or dark approaching to black, and very unbroken—and the outer circle of all green, grey, or white; and in proportion as all these form distinct circles, and the individual pips are flat, &c., does the value of the flower increase. There is anothor property estimated in London and its vicinity more than in the country. The Metropolitan Society consider it a leading property that the auricula should form a bold truss of seven pips or flowers at the least; in the country they do not require more than five. Thus many flowers will do for the country that would not do in the metropolis.

In roses, novelty seem to have been the leading point, and many growers have discovered novelty where nobody else could; but there are properties as essential to a good rose, as to any other flower, novelty forming one of them. A rose should be strongly perfumed—the petals should be thick, round, and plentiful; the color bright, and the flower double; the more of these properties are possessed by a rose, the better it is. Hundreds, however, are in cultivation so nearly resembling each other, so nearly approaching to single, so weak in their perfume, and so straggling in their growth, as to make every amateur who has purchased largely repent truly that he has been governed by fine names, instead of fine qualities. Geraniums have come in for their share of attention as to properties. The majority of them have petals so narrow, that, as there are but five, they divide and form an irregular star; they ought, like the heart's-ease, to be wide enough, to lap over each other, and form a whole and nearly circular flower rather companulated than otherwise. These ought to come in trusses, comprising at least six or eight blooms each, and forming good close heads. Bright colors, novel pencilling, and deep dark spots on the upper petals, are in great esteem; but the best at present, for form and style of growth, is Dennis's Perfection, though the color is deficient. Others asserted to be *as well formed* and *better colored*, are said to have been raised and coming out, if not out already; and indeed we have observed several bright and good flowers which very closely approached it, but we confess we have not seen any fully up to the point; and though, as we have said before, the coloring is deficient, we have not seen any one so complete in form of flowers, beauty of truss, and general style of growth. The principal object we have in view here is to show that, in the estimate of properties by the Metropolian Society of Florists, regard is had to those points which please every body; that in fact, taken in any way, an ordinary flower placed by the side of a flower approaching the standard of perfection, if down, shall appear inferior to ordinary observers, that the properties estimated as valuable to the connoisseur shall enlist among its admirers all persons of taste, whether florists or not; and when we resume this subject to go into details, we shall be able also to show, that there is a good reason to be made apparent to common observers, for every point esteemed by the society as essential to a good flower. In tulip growers we have observed more whimsical notions than among any other class of florists. But such is the advantage, of setting even the experienced cultivator upon a right course, with regard to the properties of flowers, that there are sorts which bore a great price now hardly cared for, and others which bore no price at all gradually becoming favorites. The uncertainty of the bloom will always render the possession of a bed of flowers a source of an anxious pleasure, because there are varieties usually stained at the bottom, and therefore worthless, but which sometimes come very clean and fine, and they are then grand beyond description. Nine times out of ten a *Siam* will beat a *Louis*, but the tenth time the *Louis* may come without its usual stain at the bottom, and then it is a sight worth travelling miles for. But a Louis has never won at the Metropolitan Society's shows, and we doubt if it ever will, because, if one does happen to come clear, which is not twice in a century, we might as well persuade a grower to cut off his own head as to cut his bloom to exhibit. *Pompe funebre*, a valuable or rather a *high-priced* flower, is certainly a worse flower than a Polyphemus, in every stage, from blight to perfection, and as a single flower in competition, it will not create a moment's doubt. The Metropolitan Society's rules would enable a man, who never saw flowers, to judge which was the best, and there is no small difficulty, when old cultivators are selected for judges, to keep them from giving the prizes to dear flowers instead of those of good properties. These, however, are difficulties easily got over; and we conclude for the present by congratulating the general cultivator of flowers upon the great advantages derived from coming to a general understanding upon what are esteemed the real properties of flowers.

A FIRST EXPERIMENT OF REARING SILK-WORMS UNDER VERY DISADVANTAGEOUS CIRCUMSTANCES.

For the Farmers' Register.

The weather had been unusually warm, for the season, for some days preceding the 13th of April, on which day it changed to cloudy, raw and cold, with drizzle of rain in the evening. Some silk-worms' eggs, which had been brought to Petersburg, for sale, two days before, (and probably exposed to much of the then warm weather, on the journey,) were observed this forenoon (13th) to be hatching; and by evening, so many had hatched, that it was evident the eggs were no longer worth any thing for future sale, and both the weather and the state of the mulberry trees seemed to make it almost a hopeless attempt to raise the worms with any success. Under these circumstances, the young worms, and the eggs still unhatched, were given away to any person who would take the trouble of attending to them. I took some, partly to try the experiment of their ability to bear such very inclement weather, and partly to preserve the lives of as many as possible, until other persons, better provided with food, could take them off my hands. Not having a single mulberry tree in this neighborhood, nor indeed then knowing where one was standing, of course I had not counted on feeding silk-worms here. The permission to use the leaves of a few white mulberry trees was soon obtained. The largest leaves of the most vigorous shoots of white mulberry were then not larger than a half-dime, and generally the leaf buds were but barely opened. The native mulberry leaves (*morus rubra*,) had not then opened enough to be used at all.

The very early commencement of this experiment, the unfriendly state the weather and general low average temperature throughout, and the other and great disadvantages to the silk-worms caused by the want of experience and knowledge of their proper management, and the want of suitable accommodations, all concurred to make the experiment, almost to its close, of very doubtful issue, as well as very troublesome in execution; and there was little hope, from the commencement, of even a moderate degree of success in the result. The products finally obtained, though doubtless of much less amount than better, proper, and yet *perfectly* and *easily attainable* means would certainly secure, are yet such as to induce the opinion that it may be useful to other inexperienced beginners, to know the general facts of a rearing conducted under circumstances so unpropitious in almost every particular. A very minute diary was kept, which furnishes the materials for the following abstract. It would be useless to present all the entries in full; as many of them are but details of mishaps, of mismanagement, and of erroneous opinions which were corrected by longer observation. Nothing will be withheld, however, in this general statement, that is deemed material.

The weather was throughout too cold; no one day even having average temperature as high as is deemed requisite by the writers on silk culture. This will be best seen from the record kept of observations of the thermometer, of both the external air, and that of the apartment in which the worms were fed. The thermometer showing the former, was suspended beneath the outer eaves of a porch on the north side of the house, and protected by its situation always from the sun. Another thermometer (both alike and correct,) hung in the middle of the feeding room, the size of which is 10 feet by 12, and 7½ feet high. It is a common apartment in the upper story of a wooden dwelling house, facing the south, in which side *is its only* window, and the door to the north. The temperature was just such as would be of any room in a common framed building, lathed and plastered, without being affected by artificial heat. The fires in the house, during the coldest of the weather, were too distant to have raised the temperature of this room. In fair weather, whenever the exterior temperature was highest, and that was almost always the case in the middle of the day, (or from 10 to 4,) the window was raised, and the door kept open; unless the wind was too high, and that was also often the case. At such times, the outer air was admitted through an upper pane of the window, broken out for the purpose, and which was but imperfectly closed with paper at night, and in rainy weather. Thus, low as the interior temperature may appear at 2 o'clock, it was generally some degrees higher than it would have been, if the outer and then warmer air had not been freely admitted. It usually continued as warm within, as at 2 P. M., until 5, and sometimes to 7. The door of the room opened to a staircase, and thence to the outer door below, which was rarely closed, in any weather, as long as any of the family were awake. It may be observed however from the record, that notwithstanding the want of any proper means of moderating the extremes of the variations of external temperature, or preventing the entrance of the outer air, that the fluctuations were very far less within than without.

The observations of temperature were usually made a little after sunrise, about 2 o'clock, and and at 9 at night, or something later, and always on the two thermometers at the same time. Small variations from these times were not regarded; but some material ones will be marked.

For accommodations, at first there was nothing better than wide and shallow paste-board trays or tops of boxes, (such as merchants keep fine goods in,) and sheets of papers laid upon two common dining tables. After the worms had become much crowded, (and indeed they were too much crowded throughout,) and were suffering for enlarged space, four feeding shelves were put up, 12 feet long, three wide, on the plan described at p. 247, vol. vii., of Farmers' Register. These furnished all the space used in the last stage of feeding, and on this, to prevent mixing different parcels, the worms were unequally distributed, and some were greatly crowded, while others had more than space enough.

The worms were said to be of the gray four-cast kind, producing cocoons generally of deep orange color, a few of sulphur yellow, and still fewer of pure white. Nearly or quite as many of the worms proved to be white as gray; but no difference was observed except in color. The number which were fed, by careful estimates subsequently made, and on different grounds, were supposed to be about 10,000.

So little food is required at first, that, cold as was the weather, the leaves grew fast enough for the silk-worms. Though the frosts nipped the leaves in town, and killed many of the youngest in the surrounding country after the oldest leaves were as large as a quarter of a dollar, still the lower leaves were not killed, and there would have been no entire cutting off of the supply, even where most damage was suffered.

The supply of food, though generally abundant, (and one great error committed was its being much too lavishly laid on,) was deficient at some times; and the worms must have suffered on account of too long fasting, or the too dry state of the leaves. They were usually fed (unless when too cold and benumbed to eat,) soon after sunrise, and frequently throughout the day, to 9 or 10 o'clock at night, when they had a double feed, and no repetition until next morning.

These general statements will enable me to omit many separate and particular ones to the same purport in the following diary.

April 13th. The worms hatched that day brought to my house, and first fed at night.

14th. Morning clear—but still colder than the day before. Thermometer not exposed then to outer air, nor observed early. Half an hour after sunrise, and still longer after the fire had been burning in the sitting room of my family, the temperature of the table on which had been placed the hatched worms, (and balance of eggs,) was 49 degrees. But few more hatched to day. Fire kept up in the room, and food given frequently.

15th. Clear—temperature of outer air 38½ degrees half an hour after sunrise. The worms benumbed with cold, and scarcely showing any motion, though the fire had been designedly left burning the night before, and probably kept burning until 1 o'clock, and the room was close. Frost out of town, though not observed within its limits.

16th. Clear, and warmer. The worms which hatched through this day were carefully separated from the eggs still unhatched, by placing over them perforated paper, through the holes of which they crawled, almost as soon as hatched, to tender sprouts of mulberry leaves placed upon the paper above. These, which were about 1900 in number, (as subsequently and carefully estimated,) were made the subject of particular observation; and these and all later hatched, (unlike the older ones hatched in the preceding days,) had no benefit whatever of warmth from fire. It was to day first thought of to make and record regular observations of the temperature, and other circumstances; and this hatching, of the 16th, was selected for fair trial, and particular observation; and to which alone reference will hereafter be made, unless when otherwise mentioned. The treatment and the advantages and disadvantages of every parcel were alike, after this day, except as to space—and the experiment worms were among the most crowded.

April 17th. Clear. First day of first age of experiment lot of worms. I should have called this the *second*—but for conforming to Dandolo, who does not count the day in which the worms are hatched. The hatching of this day also preserved, separately, and all the remaining eggs thrown away. All the worms this morning were moved to the small room above described. Turning colder. At 9 P. M., interior temperature 61 degrees.

April 18th.—2nd day of first age.

	Morning	2 P. M.	9 P. M.
Temperature, exterior,	42°	66	42
" interior,	53	66	56

April 19th—3rd day of first age.

	Morning	2 P. M.	9 P. M.
Temperature, ext.	35½	66½	54
" int.	49	59	65

Clear. Frost. At sunrise, all the worms (of every lot,) benumbed with cold, motionless, and very little of the latest previous meal (of 9 P. M.) consumed. Earliest meal delayed until 7, when the worms had revived by increasing warmth. Turning warmer towards night.

April 20.—4th day of first age.

	Morning.	2 P. M.	9 P. M.
Temperature, ext.	46	72	55
" int.	59	71	69

Clear morning. This the first warm day. At 2 P. M. cloudy, and a very little rain.

April 21st.—5th day of first age.

	Morning.	2 o'clock.	9 P. M.
Temperature, ext.	49	63	45½
" int.	60½	61	60

Again becoming very cold.

April 22nd.—6th day of first age.

	Morning.	2 P. M.	9 P. M.
Temperature, ext.	34	68	51
" int.	50	62	64

Heavy white frost. Fog in the morning. The edges of some of the young white mulberry leaves here, and also those of the morus multicaulis, were seen to be seared by the frost. In the country, 16 miles below, as I afterwards heard, the tender extremities of shoots of both kinds, were killed in some situations, but not in the more sheltered—nor the oldest and largest leaves of either, in the most exposed situations. Damage to leaves of one kind of tree as great as of the other.

The worms (of all the lots,) had eaten but little of the last night's meal, and were this morning numb and motionless with cold. No food given, or wanted, until 7 A. M.

April 23rd.—7th day of first age.

	Morning.	2 P. M.	9 P. M.
Temperature, ext.	39½	78	68
" int.	55	70	71

Clear. Notwithstanding the severity of the cold, and great variations of temperature, and by which the worms certainly must suffer, they do not appear to have sustained any injury; and except when benumbed with cold, seem to be doing perfectly well. Some worms of the older lots (hatched 13th) have became torpid.

April 24th.—8th day of first age.

	Morning.	2 P. M.	
Temperature, ext.	52	80	68
“ int.	65	75	75

Clear. All the older worms, (hatchings of 13th and 14th,) now torpid, and also some of the hatching of 16th. But little food given the latter.

April 25th.—9th day of first age.

	Morning.	2 P. M	9 P. M.
Temperature, ext.	60	86½	69
“ int.	68½	78½	78

Clear—and a continuation of a remarkable spell of dry weather, for the time of year. All the worms of 16th, torpid, which makes the end of their first age.

April 26th.—10th day, and 1st of second age.

	Morning	2 P. M.	9 P. M.
Temperature, ext.	54	75	50
“ int.	67	69	69

At 6. 45 P. M., the interior temperature was as high as 72.

Largest leaves of the white mulberry (seedling trees,) now 1¼ inches long.

As indicated above, turning very cold at night.

After a state of torpidity and total fast for 36 hours, (two nights and the intervening day,) the worms hatched the 16th revived, commencing their *second age*. After a few hours more, (before which they do not need food, and will eat very little, if it be furnished,) they were given tender shoots of mulberry, and were then moved to clean places. The food had been of chopped leaves until the last few days. Since, of whole leaves.

The litter was about an inch thick, yet dry, and the scent as sweet as of newly made hay.

April 27th.—11th day, and 2nd of second age.

	Morning.	2 P. M.	9 P. M.
Temperature, ext.	42	86½	71
“ int.	59	76½	77

Another very cold morning followed by a hot day. Difference of extremes of exterior temperature, in 7 hours, 44½ degrees.

April 28th.—12th day, and 3rd of second age.

	Morning.	2 P. M.	9 P. M.
Temperature, ext.	62	87	68
“ int.	70	81	79½

Cloudy and sultry by 2, and promise of rain, but only a few drops fell in the evening.

29th.—13th day, and 4th of second age.

	Morning.	2 P. M.	9 P. M.
Temperature, ext.	63	82	65
“ int.	74	78½	76½

Cloudy and sultry.

Finished examining, with great care, the last hurdles of litter from which any worms have been transferred. The litter of the whole has now been carefully looked through, for the purpose of knowing the precise number of dead, or diseased worms. Only a single one found dead, and that was not a quarter of an inch long. The sluggish and latest revived worms (among which the sick would be, if there were any,) of every lot have been put together into a separate place, as a *hospital*, to be fed and observed separately, and to note the fact of any being really diseased, or dying. This was done until the fourth moulting, and the worms were observed until known to be as brisk and as well as any, when they were removed to different lots of like states of growth; and I will here anticipate the result of all these observations by adding that only two more worms, making three in all, were *found dead*, in the litter, or known to have died, in that time; and all these were such as had not reached the first moulting; and these few might well have been hurt by the removal from the mass of eggs in which they were enveloped when hatched.

This day by 8 A. M. some of the experiment lot (hatching of 16th) torpid, or about to moult the second time. By 2 P. M. nearly all of them so. Some very slight feedings, a single leaf at a place, and that only where worms were seen in motion—and later observation induced the belief that this was unnecessary, and hurtful. At 5.30 P. M. none yet moulted, though many in slight motion, which was not the case in the first torpid state. (The oldest worms, hatchings of 13th and 14th, and some of 15th, which were torpid yesterday, revived to day, and were transferred, on fresh leaves, to clean places at night.)

This is the end of the second age of the experiment lot. The first continued from 17th to 25th inclusive, (not counting the 16th during which they hatched,) 9 days, which is 4 more than Dandolo counts, with his artificial and higher and regular temperature. The second age has been from 26th to 29th inclusive, 4 days, which is exactly his time. But the present size of these is greater than he describes. He says that at the close of the second age they are rather more than 6 lines. The largest of these, in their second torpid state, are nearly or quite three quarters of an inch.

At 9.30 P. M. nearly all of this lot (16th) still. A few struggling to get off their old skins, but not one yet has moulted.

April 30th.—14th day, and 1st of third age.

	Morning.	2 o'clock.	9 P. M.
Temperature, ext.	61	82	65½
“ int.	72	78	76

A fine rain last night, which continued to 6 A. M. Never was rain more wanting in April.

A few worms, of the experiment lot, had moulted by sunrise, but the greater number were more quiet than last night. By 12, nearly all had moulted, and had dropped their black muzzles, and showed larger new ones, of pale brown.

By 1 P. M. fed with fresh shoots, to transfer the revived; found it was too soon, as less than half only rose to eat, and were lifted to a clean place. Yet it was from 28 to 30 hours since the last food was given that was needed, and 22 hours since a leaf had been furnished. By 5 P. M. transferred as many more as made rather more than half the lot. The remaining slower ones, still refusing to eat, were left on their old litter (not shifted since first moulting,) for experiment. Thus the lot hatched on 16th, is now divided, by difference of advancement, into two parts, which will be designated, the former as No. 1, the latter as No. 2.

More and heavy rain in the course of the day, and the air very damp.

May 1st.—15th day, and 2nd of third age.

	Morning	2 P. M.	9 P. M.
Temperature, ext.	64	83	not noted.
“ int.	70	78	

Showery in the morning—afterwards clear and warm—and rain again at sunset.

The old litter accumulated on the paste-board trays since first moulting and removal, and now an inch or more thick, is to day damp enough to be pliant, instead of being crisp with dryness, as heretofore. This is the effect of damp weather solely, and not at all of the excrement of the worms, which is always firm, and seems scarcely moist at first, and not at all so after a few minutes. The great difference between the present damp and previous dry state of the litter is a striking illustration of the prodigious difference in results between rearing silk-worms in climates varying even but a little in their different degrees of dryness.

May 2nd.—16th day, and 3rd of third age.

	Morning	2 P. M.	9 P. M.
Temperature, ext.	64	80½	69
" int.	72	78	76

Very hot. In the evening, a tremendous storm of wind and rain, with thunder and lightning.

May 3rd.—17th day, and 4th of third age.

	Morning	2 o'clock	10.30 P. M.
Temperature, ext.	64	74	54½
" int.	72½	71½	68½

Clear until 6 P. M. then cloudy, and a change to cold. Windy generally of late. The litter of No. 1 of experiment lot, (and still more of the older worms,) damp and mouldy, and must be injurious to the worms, besides their being greatly crowded. They should have been transferred before this; but I had been expecting to have suitable shelves erected, which will be, at last, ready to put up to-morrow. By 8 P. M. the worms of this lot generally torpid, and a few have already moulted for the fourth time. No food given them after 4 P. M.

May 4th.—18th day, and 5th of third age.

	Morning	8.30 A. M.	2 P. M.	9 P. M.
Temp. ext.	43½	49½	92	48
" int.	59	56 & 53	60½	60

Clear. At sunrise the worms of all the lots numb and motionless with cold. Not one in a thousand crawling. Yet the older lots (of 13th and 14th,) revived from their 4th dormant state, eat with keen appetite last night. Of course no food required, or given to any, this morning.

Between 7 and 10 P. M. put up in the room four shelves, 12 feet long and 3 wide, two covered with smooth paste-boards, slightly tacked on, and two with cotton cloth tightly stretched over the frame-work.

At 8.30 A. M., while the window was open to draw in the shelves, the temperature of the room fell to 53. It had been 56 before opening the window.

The worms continued too cold to eat when fed at 10, A. M. as soon as the new shelves were ready to receive them. As it was essential to remove them from their present damp and fermenting beds, as soon as possible, about two-thirds of No. 1. were lifted by hand. The balance left until they will rise to food.

May 5th.—19th day, and 6th of third age.

	Morning	2 P. M.	9 P. M.
Temperature, ext.	43	76½	64½
" int.	54	67½	71

Clear. Some worms showing more motion than was expected in so cold a morning. At 8 A. M. gave a light meal to No. 1., of which most of them eat a little; and by 10 A. M. all of them were again still, as if commencing their last torpid state, which the cold spell had interrupted and delayed. Scarcely any food eaten by No. 1 of the experiment lot from 4 P. M. on the 3d, to 7 A. M. on 4th. Those of No. 2, have been less crowded latterly and are evidently in best condition. These were not fed at all during this time, and were first fed this morning.

Largest worms of the experiment lot now an inch and a quarter in length.

Removed last of No. 1 to the clean shelf. The old litter left was damp and mouldy. At 9 P. M. nearly all of them had moulted. Of No. 2, very few yet moulted, and all the others still torpid. This shows the advantage of separating every lot, as soon as it revives, into two parts, the early and the latter. This separation is easily and conveniently effected by means of the net hurdles. These, however, have been received so late, that very little use can be made of them.

May 6th.—20th day, and 1st day of fourth age.

	Morning	2 P. M.	9 P. M.
Temperature, ext.	51	76	57½
" int.	66	70	70

Worms of No. 1, well revived. Feeding of No. 2 (of same lot) delayed until 10 A. M. to transfer them, which was too soon, as not more than a fourth rose to eat.

May 7th.—21st day, and 2nd of fourth age.

	Morning	2 P. M.	5.40 P. M.	10 P. M.
Temp. ext.	49	85	81	64
" int.	63½	75	78	76

Clear. Appetite of experiment lot strong. Their greatest length, 1½ inches, or a little more. No. 2, (placed on upper shelf,) the greater part of them being yet on the old litter not changed since first moulting. These on a paste-board tray.

An experiment has shown me that the sleep, or torpid state, of the worms is much longer than was supposed. For more particular observation, two worms, of the hatching of the 16th, which seemed to be very equal, were put in a box to themselves, where they were supplied well with food, and of course had abundance of space. This was on the 4th, when they were approaching their fourth moulting. They eat but little on that forenoon, and at 2 P. M. on the same day, it was observed that they had all become torpid. At sunrise on the 7th, observed that both of them had moulted in the course of the previous night. At 10 A. M. one of them first eat a very little, 66 hours after being first observed to be torpid. At 12 the other began to eat, and both with appetite, but still very lightly, 70 hours after becoming torpid, and at least 7 hours (it may be 15,) after moulting. If all worms, in the best condition, would be like this, and those kept together were precisely equally advanced, all feeding might be suspended for nearly or quite three days and nights, not only without injury, but greatly to the benefit of the worms. These two worms began to spin on the 15th of May, which was their 29th day. It would be of great use, and afford much instruction to a beginner, to put aside, from the first, two or three worms of each day's hatching, keeping each one separately, and noting the progress and changes of each. Being always in the best condition as to food and space, and in condition similar to the great body of worms as to temperature, these would be kept a little in advance of the great number, and, being separately and carefully observed, their changes would serve well to indicate every approaching change in the others. It would have saved me from much more of doubt and uncertainty, and have given me much useful and precise information, if these two worms, instead of at so late a period, had been separated and observed from the day of their hatching.

May 8th.—22nd day, and 3rd of fourth age.

	Morning	2 P. M.	6.15 P. M.	10 P. M.
Temp. ext.	61½	86	81	73
" int.	73	81	91	79

Clear.—Appetite of experiment lot much slackened by noon, and at 6 P. M. more than half seemed to have begun their fourth sleep. The last light feed given at 6 P. M. Largest size of this lot 1⅞ inches. By 10, a number had moulted. No. 2 fed throughout the day, being less advanced. (Some of 13th already roused from their fourth sleep, and those were transferred easily by means of a net hurdle, and the lot was thus assorted into two more equally advanced divisions. It also served to thin them, which was much needed.)

May 9th.—23rd day, and 4th of fourth age.

	Morning.	3 P. M.	9 P. M.
Temperature, ext.	67½	not	66
" int.	76	observed	73

Cloudy, and light showers in the morning. After 2, steady drizzle. Air very damp. At 10 A. M. supposing the worms of No. 1 enough revived to be transferred, I attempted it, by offering them food on a net hurdle placed above. But few rose to eat, and not one fourth of them by 7 P. M. when the hurdle was lifted and removed. Those left, generally still, and no food given them. Those of No. 2 have required to be fed through the day, as before.

May 10th.—24th day, and 1st of fifth age.

	Morning.	2 P. M.	9 P. M.
Temperature, ext.	64½	54	47
" int.	71	65	59½

Steady rain all last night, which increased to-day to a storm of wind as well as rain. Fortunately, in anticipation of this worse weather, a stock of leaves had been gathered yesterday, though during rain, which lasted until 1 P. M. to-day.

Transferred of the best revived worms of No. 1 as many as would rise to food. Balance, not fed, nor needing it, until noon, it being 42 hours since any leaves had been given to them. Then they were transferred to clean shelves; as also No 2, and all the other lots—the whole being now on the new shelves. The litter from which some of the oldest worms (hatching of April 13th,) were now removed, had not been cleaned or transferred since first moulting. These were on a large paste-board tray, or shallow box, in which litter always kept much dryer than on the table. The observation of this fact, some time before, had induced me to prefer cotton cloth to close board floors. On the latter, a mass of damp litter cannot dry at bottom; on the cloth, it is exposed to air and is drying at bottom as well as at top. The particular tray of litter left so long for trial, and just referred to, when thrown out to-day, was generally green, dry, except being pliant from the damp atmosphere, and sweet in scent, like newly cured hay. One spot only, in the middle, where it lay two inches thick, it was mouldy.

All the worms of the experiment lot, until their being transferred and thinned after this last moulting, were kept too much crowded; and though, if there had been no mode of comparison, I should have considered them as in first-rate condition, there is sufficient evidence at hand that they might have done much better. The worms hatched on the 17th, were fewer in number than any other lot, and therefore had more space than any. They have received less attention, by far, than those hatched on the 16th; yet the former have become as much advanced, are more regular in size, and altogether are of finer appearance. These also have until now, been lying on a table where most exposed to the wind, which, though feared as hurtful, probably helped them.

Lately, while the weather was yet clear, I was afraid of a failure of the supply of leaves, and this horrible spell of cold and wet weather makes the prospect much worse. From one or both these causes, there is now great danger of a total loss of the silk-worms. No food given to any after 1 P. M., for want of dry leaves, except a very slight meal at 9 P. M. Some had been gathered in the rain, and were spread on net hurdles to day. Luckily the youngest and latest moulted worms have not yet acquired much appetite, and bear the privation of food better than the older.

May 11th.—25th day, and 2nd of fifth age.

	Morning	2 P. M.	9 P. M.
Temperature, ext.	48½	68½	51
" int.	54	61	63

Cloudy in the morning; afterwards clear, and strong wind.

The worms generally quiet, from cold, and none would eat until 11 A. M. when first feeding was begun. Fed repeatedly afterwards, but they eat very little compared even to yesterday—though, but for the weather, the appetite of all the lots would have greatly increased.

May 12.—26th day, and 3rd of fifth age.

	Morning	2 P. M.	9 P. M.
Temperature, ext.	40½	71	58
" int.	57	66	67

Clear and windy. Worms scarcely moving in the morning, and therefore not fed until 7 A. M.; then they began to eat heartily, though the temperature continues so low. The largest worms of the experiment lot now 2½ inches long; but sizes various, thereby showing evident injury sustained from having been too much crowded. Light rain began again at 9 P. M. Stock of leaves exhausted, and therefore no feeding as usual at 9. This fast must be very injurious in the present state of the worms, and their appetite now growing hourly.

May 13th—27th day, and 4th of fifth age.

	Morning	2 P. M.	4.30 P. M.	9 P. M.
Temp. ext.	58	73	76	70
" int.	61½	74	76	77

A day of rains—some mere April showers, but others remarkably heavy. After 12 o'clock, the rains were separated by gleams of sunshine. The air excessively damp even in close apartments; and that of the silk-worms, had the door kept open, for better ventilation, and the air-hole, which had been made by breaking out an upper pane of glass, was scarcely more than half closed by a piece of paper tied over the opening.

At 5 A. M. when fearing that all must be lost, and speedily, for want of food, a wagon arrived with white mulberry leaves in bags, brought from my farm 16 miles distant. They had been gathered the preceeding afternoon, and were ordered to be here by 10 at night; but the extreme darkness of the night compelled a stop on the road, by which the leaves were kept in the bags 7 hours longer than was expected. They had become hot, in every bag; and a thermometer put into the leaves from the middle of one of the bags, taken at hazard, as soon as emptied, rose to 105 degrees. The leaves were immediately spread on cellar (earthen) floors. This supply was all-important to the worms; and throughout the day, the sustained voracity with which they devoured was astonishing. The slow remnants of several lots, had not yet revived from their fourth torpid state.

To my surprise, a few worms of the earliest hatching, began to spin this forenoon, it being their 30th day.

Morning drizzly, and at 9 P. M. another very heavy rain, with thunder and lightning. The last meal at night double as heavy as any before, and given to all the worms—the most backward lot having then well revived.

May 14th.—28th day, and 5th of fifth age.

	Morning	2 P. M.	11 P. M.
Temperature, ext.	59	72	60
" int.	70	69	70

Morning cloudy; by 7 A. M. cleared up, and a fine day afterwards. Appetite of experiment lot in general somewhat abated, and a few of them began to spin—and many of the older worms of other lots. But none are yet disposed to climb well, though provided with the twine ladders, as directed at page 248 of last number of Farmers' Register. Supposed (at first) the cause to be that the earliest spinners were *premature*, from some injury, or privation, though not otherwise made manifest; for all have suffered so much by the prevalence of cold throughout, and other disadvantages, that the time of spinning was expected to be later then these beginnings, by five days at least. They have actually begun three days earlier than according to Dandolo's rules, when supposed to be under the most perfect and suitable artificial temperature, and best treatment.

Lest there should be any want of food in the present critical state of the worms, and when they are expected to cease eating very soon, and that they might select the freshest, the leaves were given very frequently and lavishly.

May 15th.—29th day, and 6th of fifth age.

	Morning	2 P. M.	5 P. M.	11 P. M.
Temp. ext.	57	85	85	68
" int.	67	80	82	78

Fine bright day—windy, and dry air. Contrary to expectation, the appetite of the experiment lot, instead of abating, is increased. This is doubtless owing to the increased warmth and dryness of the air. Until the latter part of yesterday, the weather could scarcely have been worse than it has continued from the 9th inst. to 14th inclusive—and this at the most critical age and condition of the worms, when they suffer particularly from every privation, and when no time is left to repair, by better subsequent care, any damage then sustained.

This is the only day since the feeding commenced which has not been much too cold, wholly or in part.

The food used, up to this evening, is still entirely of the leaves gathered on the 12th, and brought 16 miles, and now more than three days old. They were, when the last were used, at 5 P. M. nearly or quite as dry as grass half cured for hay; yet they were still eaten greedily by the worms, though no doubt fresh leaves would have been better relished and also healthier food. Those left, after the meal given at 5 P. M. were quite too dry to be given, and there was no other supply then on hand for later feeding. However, a supply fortunately arrived by 10 P. M. in bags partly warm with fermentation, and a good meal was given, which seemed to invite redoubled appetite.

All the worms have grown much since yesterday. The largest of the experiment lot are now 2¾ inches long, and can stretch out to 3 inches. But few of them yet have begun to spin, except of No 2, and part of No 1, previously the most backward, which were *on the highest shelf;* and these also climbed the best, though still far from well. The cause of this more rapid progress was afterwards discovered in the fact that the temperature of the atmosphere above the upper shelf was usually 2 degrees higher than that below the lowest, though the perpendicular distance is but about 5 feet. This difference was observed both when the room was closed, and when opened, and the air passing through freely. The other worms of No 1 were now, divided between a hurdle on the lowest and another on one of the central shelves. The position of the thermometer, by which the interior temperature has been marked, is nearly midway between the extremes of elevation. If so great a difference had been known of early, it would have afforded easy means for equalizing and bringing together worms of the most remote states of advancement and growth.

For the last three days, the leaves have been so heaped on, and so large a proportion left unconsumed, that I fear they will ferment, if the worms do not hasten their climbing, and finish much sooner than now seems at all probable. The many shoots and twigs intermixed, also, are found hurtful; as they induce the worms to spin upon them, and among the litter.

May 16th.—30th day, and 7th of fifth age.

	Morning	11 A. M.	2 P. M.	9 P. M.
Temp. ext.	59	84	86	60
" int.	72½	77	81	88

Clear, and a warm day. Though the fresh food was laid on last night, to 11 o'clock, very heavily, before morning it was all devoured. Fed as usual at 5, and then not again, (by inadvertent omission,) until 11 A. M., which was a very improper and probably hurtful privation.

The worms of the hatching of April 16th seem now to have generally reached full size, (more than 3 inches long,) and yet but few have begun to spin. Judging by the oldest (of the 13th,) which, as fore-runners, have been very useful to my observations on the experiment lot, it seems that nearly all, if left to themselves, would spin among the litter. In regard to their climbing to spin, I expected difficulty; and I now fear in it utter failure.

May 17th.—31st day, and 8th of fifth age.

	Morning	2 P. M.	9 P. M.
Temperature, ext.	62	86	67½
" int.	73	80	78

The disposition to climb seems rather to have abated than increased, and now I despair of it. Not more than one in twenty have yet climbed, (including the oldest,) and in waiting for the others to do so, unaided, I fear that their energy and health have already been wasting, judging from the shunken appearance, and soft flaccid feel to the touch, of the worms of the experiment lot, and those still older. There seemed to be no hope of saving them, except by the very troublesome, laborious, and, to the worms, hurtful procedure, of lifting every one by hand, and putting them in suitable places to spin. This was forthwith commenced. The worms placed under the shelves floored with cotton cloth, adhered well, and generally soon began to spin. From the sleek pasteboard floors, they dropped almost as fast as put on; and the two shelves so fixed were nearly useless as spinning places. The wood-work, also was planed too smooth; and rougher surfaces would have served better. After filling all these suitable receptacles, next all the jelly and wine-glasses at hand were put in requisition; and about two thousand little paper cones made and hung up, in each of all of which a worm was put to spin. These troublesome means served admirably in this case of pressing necessity; but, of course, such are out of the question for ordinary or profitable procedure in rearing silk-worms. By all the means used, all the worms of April the 13th, 14th, and 15th, and part of the experiment lot, were disposed of by night; and the hurdles, or shelves from which all were entirely removed, were immediately after cleaned of the litter, which was about four inches thick, generally, mouldy beneath the surface, and when turned up, offensive to the smell. These and all ought to have been cleaned some days before. But, besides the twine ladders at the sides and ends of the divisions, rows of twigs and sticks had been set up across all, to afford the worms more facilities for climbing to the frame-work above; and these sticks served but the more to induce the worms to form cocoons at their bottoms. Of course it was impossible to remove, or even to thin the accumulated litter, on any division, until after taking off all the worms; and even then, the partially finished and very soft cocoons, there fixed, were necessarily sacrificed; as well as such of the worms as had already exhausted too much of their material to recommence their spinning. Such as were manifestly of this class were thrown away when the litter was removed. Many of the finished cocoons, however, though enveloped in, and even covered by the litter, were firm and of good quality.

Food scarce to day; and the most backward worms, which are now ravenous, were necessarily on short allowance. At night, a heavy rain.

May 18th.—32nd day, and 9th of fifth age.

	Morning	2 P. M.	9 P. M.
Temperature, ext.	63	67	58½
" int.	71	68	66

Still raining, until noon, and interior air very damp. Notwithstanding the great and increasing coldness, it was deemed necessary to keep the door open, for ventilation, which admitted the cold and damp outer air freely from the open door below.

Several more hurdles cleared of all their worms, and immediately after of their litter, some of which was hot at bottom, with fermentation.

By night, found that, in our desperate haste to save the worms by removal, another great error had been committed; some hundreds had been moved to places to spin before they were ready to begin; and after they had been either lying quiet, or crawling about, and fasting from 6 to 21 hours, they had to be replaced on the cleaned hurdles, were fed, and returned to eating with more or less appetite. Some went to spinning very soon, and after a very light meal; more generally they continued sluggish, or continued to eat, and of course will not spin, while any appetite remains.

The course of the latest of the experiment lot of worms (all hatched on April the 16th,) may now be considered as finished, and every one of the worms as now spinning. For though it may be the case, that some of these are among the number brought back, because of refusing to spin, I do not believe it to be so. Though no separation was kept between the worms of different lots, after they were placed to spin, still there is reason to believe that all those brought back had been taken from the most backward remnants, which were considerably behind the experiment lot in progress towards maturity. The spinning then of the earliest of this lot began an the 28th day, (May 14th,) and the latest on this, the 32nd day—not counting the 16th of April, during which they were hatched.

	Morning.	2 P. M.	9 o'clock.
May 19th.—Temp. ext.	56	80	67½
" int.	62	72	73½

Clear.—Procured fresh leaves, and fed the returned worms, and all the still later ones which had not yet been moved, continuing to place for spinning all that seemed ready, until evening, when no places were left for any more. There then still remained from 800 to 1000 of the most backward worms, part of which had been brought back after being placed too soon for spinning. Not being disposed to provide leaves for, and to wait longer upon this slow remnant, and wishing to clear my dwelling house of what might become an offensive nuisance, if the sluggishness of there worms was caused by disease, as I suspected, I had all that remained put into baskets and carried to a vacant room in another house, nearly half a mile distant. Many of them were immediately placed in situations suitable for them to spin on; the greater number were spread over the floor, the remaining and last supply of leaves sprinkled over them, a number of crumpled newspapers laid over and around, and then the worms were left, to spin or die.

	Morning.	2 P. M.	9 P. M.
May 20th—Temp. ext.	58	81½	71
" int.	66	76	77

Most of the worms which are in the new location are spinning; but still others have not begun, both there and in the first room. All such as were visible, in both places, amounting to 150, were collected, after fasting 16 hours, and given a few fresh leaves. They eat a little, and being properly placed, soon began to spin.

Took down, and had wound by hand, some of the earliest cocoons.

21st. About 50 more worms had crawled from under the newspapers, and these, after fasting two entire days, were also removed, and supplied with a little food. These, as well as the others, went to spinning, and without a single exception, made cocoons, and mostly of good quality.

23rd.—Took down all the cocoons made in the dwelling house, and had a large number cleared of floss, and weighed, and various weighed parcels of different kinds counted, of which the quantities will be hereafter stated. The room then was entirely cleaned, and contrary to what had been feared, no offensive scent was left after removing the last of the old litter.

25th. Gathered all the cocoons made by the backward worms in the out house. They seemed as good as those earlier made, and every worm had spun here, as in every other case. The crumpled newspapers had served well for the fixing of cocoons upon.

No deaths from disease, or from any other than violent and known causes, have occurred, except of the three very young worms mentioned formerly. Some were crushed or injured by accidents; and in the hurried general removal, many of them fell from such heights that it was supposed they might be injured; and all such were thrown away, lest, if kept, the subsequent death of any of them might lead to error as to the cause. Some others of them, buried in the litter after beginning to spin, made very imperfect and worthless cocoons, or none, and when uncovered and dislodged, though all living, their advancement towards the chrysalis state, and therefore the exhaustion of their silk material, had gone too far for them to recommence spinning cocoons, to any purpose. These were also thrown away. Since the favorable issue of the other worms, I regret that all of these two discriptions had not been saved to themselves, and the precise degree of necessary loss among them observed; as I have reason to believe that much the greater part of all of those thrown away because of their having fallen from heights of 5 to 7 feet, were in fact not materially hurt, and would have spun well, if preserved. But, at that time, nearly all the worms were supposed to be in great jeopardy; and so much trouble was required to save the greater number, that there was no time to experiment with, or even to think of counting, the few hurt or exhausted, and thrown away. But I am confident that all that were thrown away as doubtful, and lost, for these and for all other causes, did not amount to more than 100 out of the whole rearing; and that there were not more than 150 others of the whole, that spun cocoons so imperfect as to be unfit for any use.

So much as to the losses; now for the quality and quantity of the product.

As stated above, finally not one worm, even of the slowest, failed to spin a cocoon. The whole number of cocoons, after being stripped of their floss (and more closely than was afterwards found to be necessary,) amounted to 2 bushels and 2¼ pecks. Nearly all the amount was ascertained by accurate measurement; but a small proportion, by estimate only.

Of the quality of cocoons I know nothing; except that Dandolo says that 360 of the common four-cast worms, (to which these belong,) are required to weigh a pound. Of these, various careful and fair trials gave the following results:

Of 5¼ lbs of cocoons, stripped of the floss, and taken without selection, (except that none were of those spun among the litter,) the average number to the pound was 326½. In two other trials, of smaller quantities, in one case 336 were required to make a pound, and in the other only 296. Of the cocoons spun in the litter (which altogether were not quite a peck and a half,) 408, taken as they came, made a pound. Of good and firm cocoons, picked out to produce eggs, and from which all double cocoons, *(dupions)* had been carefully excluded, 267 weighed a pound. All these were after the floss had been removed. The next trial was with the floss on (which however weighs very little,) and the best result of all, considering the circumstances. Of the cocoons spun upon the old newspapers by the most backward worms, and taken as they came, 291 only made a pound.

While gathering my cocoons, Mr. Gay, the inventor of the machinery for winding and twisting silk, unexpectedly arrived in town to exhibit the operation; and he was much surprised, as well gratified, to find, so early in the season, new cocoons ready for him to operate on, and of such good quality as he pronounced these to be, instead of the very inferior parcels of last year's produce, which he had brought with him for that purpose. He said that these cocoons, taken together, were far better than any he had ever seen made in New Jersey or farther north; and, after full trial, he added that they were better than any he had ever made, or reeled, and worth more by one third, to the bushel, than what are considered good northern cocoons. He bought all of my little crop that I would spare, 1¾ bushels, at $6 the bushel; and in half an hour, on this 25th of May, some of it was undergoing the beautiful and very perfect operations of winding, doubling, and soon after of twisting, upon his admirable machine.

Mr. Gay further told me that of a peck of cocoons, first operated on by the machine, nearly all were run off completely, leaving the chrysalis perfectly naked. All these which had any cover, or even shred of the silk left on them, would not have made a handful.

But gratifying as is the general result, and unlooked-for as gratifying, (under all the adverse circumstances,)—and though there has been almost no loss of worms by disease and death, and very little in unmerchantable cocoons—still the great number of cocoons defective in size, or firmness, or both, (when compared with the best,) alone would prove that there is yet plenty of room for improvement and increase in the product. The disadvantages necessarily suffered, and some of the errors committed, are so evident as to need no further pointing out than has been done by the mere statement of procedure. And even though the full extent of my wrong management may not yet be known, nor the best remedies for those evils and errors which are fully understood, still, I have no doubt, but that even now—in the ordinary weather of a later and proper time, with sufficient and proper food, and suitable fixtures and method, and with the aid even of the little practical knowledge now gained—that nine-tenths of the loss of value in product incurred in this experiment could be avoided, and the labor and cost be diminished in a far greater degree than the product would be increased. Great as has been the trouble, and small as is the return, if viewed as remuneration, I consider the result as highly satisfactory, and strongly encouraging to future and better conducted operations.

EDMUND RUFFIN.

P. S. After the above statement had been completed, I received a letter from T. S. Pleasants, who had reared worms at Bellona from the same stock of prematurely hatched eggs. I am much gratified to learn that he succeeded well in the important particular in which my failure was so signal—that is, the climbing of the worms. He had in part such fixtures as he described in last number of Farmers' Register, and, where they were wanting, others less perfect. All served well. The only difference of treatment which he states, to which I can ascribe the great difference of result in this respect, is, that "*fires were lighted whenever the air was damp and cool.*" The need of this I was well aware of; but the situation permitted no such aid of artificial heat; and even if it had, my experiment was designed to show, as it certainly has done, the worst effects of the natural temperature, at so early, and so inclement a season. E. R.

ROSE BUSHES.

For the Farmers' Register.

For some years past, complaints have been made, that the rose bushes in and about Petersburg have been killed by an insect which in great numbers have infested them. This is a very small red bug, with a covering, or house over it, of a dusky white color, resembling dingy whitewash scaling off. In a short time this insect greatly multiplies, so as to cover the stems and branches. My own garden has been much annoyed, and I have had some of my best shrubs killed by them. Last year I had a favorite bush attacked, which I endeavored to protect by frequently applying, from a watering pot, the infusion of tobacco; but from which no good was obtained. It has long been known that sulphur, where it could conveniently be used, was a remedy against many insects on plants, but in this case there seemed to be some difficulty in its application; and until I read in one of the late numbers of the Farmers' Register of a mode by which the flowers of sulphur could be so prepared as to be applied with convenience, it did not occur to me that this was the remedy. Profiting however, by the idea there published, I mixed a quantity of that article with lamp oil, to a very soft consistence, and with a mop, spread it over the stems and branches of the plants, wherever the bugs were clustered; and I was pleased to find that although the tobacco gave them no uneasiness, this application, wherever laid on, was a certain cure.

Although this remedy requires some labor and patience, to follow these bugs among numerous prickles, over the stems and branches of extensive rose bushes, yet is the labor amply repaid to the owner of these plants, by their beauty and fragrance. L. M.

THE WHEAT CROP.

The reports of the wheat crop in Virginia, are very discouraging. The ravages of both Hessian fly and chinch-bug have been unusually destructive; and especially in the tide-water region, where the loss will be so great as to leave no average net profit on the cultivation. The crop, in the valley, or of the region west of the Blue Ridge, is said to be very fine.

"MAMMOTH" SILK-WORMS' EGGS, AND SUCCESSIVE CROPS.

We have had several urgent requests from distant correspondents to furnish them with a few of the "mammoth silk-worms' eggs." We have none, and would advise no one to rear worms of any "mammoth," or unusually large variety. We have no room left to state the reasons for this opinion, but they will be given hereafter.

Another general inquiry is as to the chance for hatching the first eggs laid in the spring, for another crop the same season. The small "two-crop" kind, may be relied on; but not any larger kind; though the eggs of the common kind, or that best known and longest in use, will sometimes hatch in Virginia, the same season they are laid. The hatching, however, at most, is but of a small proportion, and is not to be counted on with any certainty.

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PRICES CURRENT--May 30, 1839.

COUNTRY PRODUCE.

Wheat,	$1 35 to 1 37½	Tobacco,	$7½ to $16½
Flour, (superfine)	6 25 to 6 50	do. (lugs)	$6 to $8
Corn, per bushel 92 cents,		Bacon, (hog round) 12 cts.	
Cotton,	13 cts. to 15		

BRANCH, WINFREE & Co.

MORUS
MULTICAULIS AGENCY,
RICHMOND, VIRGINIA.

The subscriber offers his services to the growers of the Morus Multicaulis, as an agent for the purchase and sale of trees by contract, deliverable next fall. Persons disposed to purchase or to sell, will please communicate with the subscriber, who will give the most unremitted attention to any instructions received.

Much experience and familiarity with the subject, added to a very general personal acquaintance with the growers of the mulberry, will enable the subscriber to render very valuable and profitable service to those who may wish to operate through an agent.

JAMES WINSTON,
Richmond, Va.

P. S. Silk Reels and other Silk Machinery—Silk Worm Eggs and Cocoons, will be received for sale, or orders therefor executed.

N. B. Many of the Morus Multicaulis will be cultivated in the vicinity of Richmond this year, and with so much assiduity they will no doubt range from three to eight feet and more.

Refer to L. J. Cox, Gideon B. Smith, } *Baltimore.*
Philip Physick, M. S. Powell, } *Philadelphia.*
Saml. R. Gummere, *Burlington N. J.*
Geo. Olmstead, *East Hartford, Conn.*
Horace Pitkin, *Manchester, Conn.*

April 30—n12t

THE MARYLAND
SILK COMPANY,
OF BALTIMORE.

offer for sale

50,000 Morus Multicaulis, or Chinese Mulberry Trees.
10,000 Alpine Mulberry Trees, selected with care.
5,000 Canton do. do.
2,000 Rose of Lombardy do.
10,000 Other varieties. Apply to

LUTHER J. COX, Pres't.
March 21.—ntf Commerce street, Baltimore.

VIRGINIA SILK AGENCY.

The subscriber respectfully informs those engaged in rearing silk, that he has opened an office over the store of Messrs. James M. Radcliffe, & Co., Main street, for the purpose of attending to the silk business in all its various branches, viz.: will purchase, or dispose of for account of the growers, cocoons and silk in all stages, as soon as rates can possibly be fixed; and now offers for sale, Mammoth white, grey, and yellow, two crop white, and six weeks yellow ball silk worm eggs.

ALSO,

Morus multicaulis, in any quantity, now growing in various sections of the state, deliverable on 1st November next, in lots to suit purchasers. The best security will be given for every sale, and the same required.

All communications must be post paid.

J. H. D. LOWNES,
Richmond, Va.,
Agent for the planters.

References.—Dunlop, Moncure, & Co., Lancaster, Denby, & Co., Richmond, Va.

April 30—n&Atf

AGRICULTURAL BOOKS
FOR SALE AT THE
Office of the Farmers' Register.

The following publications are for sale at the Office of the Farmers' Register, and will be sent by mail, or otherwise as required, at the following prices, upon *cash and post-paid orders.*

	The single copy.	Or for $5 paid
Essay on Calcareous Manures, - - - -	50 cents.	10 copies.
Do. on inferior paper,		12 copies.
Johnstone on Draining, Embanking, &c., (latest edition,) - - -	75 cents.	8 copies.
Davy's Agricultural Chemistry, (latest edition,)	75 cents.	8 copies.
Directions for the management of Silk-worms &c. 2nd. edition, - - -	25 cents.	22 copies.
Treatise on Mulberry and Silk-culture, by GIDEON B. SMITH. - - -	18¾ cents.	30 copies.

All, or any of these publications, may be obtained together, in any proportions ordered, at the wholesale prices stated, for remittances of $5, or more.

In answer to frequent inquiries, it is necessary to state that none of the publications of this office are in any case sent to booksellers, to be sold. Booksellers, like all other persons, may be supplied on the above stated terms; or at a deduction of 20 per cent. on the above wholesale rates, for purchases of $20, sent in advance with the order. EDMUND RUFFIN.

April 30, 1839.

Haller Nutt
Haller Nutt

UTILITARIAN,

BY ECLIPSE,

THIS HORSE has been carefully bred with an eye to the useful qualities for the road. The excessive and extravagant estimate put upon the qualities for the turf, (there can be but little doubt,) has produced the present scarcity of fine saddle horses in Virginia.

The leading object of breeding ought to be to produce a race of horses the best suited to the useful and necessary purposes of life. Utilitarian is offered to the public as being worthy of the patronage of such gentlemen as may desire to propagate that class of the noblest of our domestic animals—the sharer and companion of our sports—the aid in our healthful exercises, and the indispensable auxiliary in many of our most important labors, the saddle and the harness horse.

This horse will stand the ensuing season, to commence the 1st April, and end the 15th July, at Bremo, in the county of Fluvanna, and will be limited to 25 mares, (with the privilege reserved of adding five more, without charge, except for feeding, provided five mares of established character as breeders are offered,) at $25, with one to the groom—each to be insured Mares will be fed at 25 cents per day—pasturage gratis—but no liability for accidents or escapes. The season to be due when the mare is known to be in foal, or is parted with.

Utilitarian is six years old this spring; a fine bay, with no other white about him except a narrow stripe around the coronet of his off hind foot, and a spot in the forehead the size of a dollar. He is 16 hands high; and while he is of the purest blood, which is doubtless essential to every first rate horse of all work, he has the stoutness of limbs and muscular powers of the hunter, with the fine action (to a considerable extent,) of his grand-sire on the dam side, who was incomparably the finest pacer and the most perfect model of saddle horse I ever knew.

PEDIGREE.

Utilitarian was got by American Eclipse; his dam by Roebuck, his grand-dam by the imported Bedford, and his great-grand-dam by imported Diomed, out of the imported mare Jennette; for whose pedigree, see the English Stud Book.

Address, Winnsville Post Office, Fluvanna county.

March 31,—n3t JOHN H. COCKE.

TO CORRESPONDENTS.

Communications on hand.—"Remarks on the Vegetable Kingdom"—Chaps. XII, XIII & XIV of "Essay of Vegetable Physiology"—"On Silk-worms and the accommodations for their spinning"—"Description and plan of a cheap and valuable farm boiler"—"On Morus Multicaulis on the Florida reefs, and obstacles to the Tropical Plant company"—"Hessian fly, and Chinch-bug, &c."—

It is a subject of regret to the editor that the effect and interest of the valuable treatise of Professor Armstrong on Vegetable Physiology, has necessarily been impaired by the division which its length required. The concluding portion will be presented as soon as possible after the manuscript shall have been furnished.

JUST PUBLISHED

In a thick octavo volume, of 725 closely printed pages, and illustrated by nine copper plates,

ELEMENTS OF CIVIL ENGINEERING,

Being an attempt to consolidate the principles of the various operations of the *Civil Engineer* into one point of view, for the use of Students, and those who may be about to embark in the profession, by John Millington, Civil Engineer; formerly Professor of Mechanics in the Royal Institution of Great Britain, and of Civil Engineering and the applications of science to the arts and manufactures in the London University, and now Professor of Chemistry, Nat. Philosophy and Civil Engineering in William and Mary College, Va.

Published by Smith & Palmer, Richmond—Judah Dobson, Philadelphia; and may be had of E. P. Nash, Petersburg.

June 1.—n2t

SILK-WORMS' EGGS.

The subscriber offers for sale silk-worms' eggs of this spring's laying, of several kinds, viz:

Of common kind of one-crop, white worms, producing orange cocoons generally—

Of one-crop white and gray worms, do.—

Of two-crop worm, which kind may be relied on to hatch again the same season.

Every care has been and will be taken to have each kind genuine, and kept separate and free from mixture with others. The eggs will be sent by mail, (or otherwise,) for orders, containing the purchase money. The prices will be as low as those of any good and genuine eggs in market; and the purchaser may rely upon receiving the article promised, and in the full quantity charged for.

Orders, *post-paid*, may be sent either to the care of the editor of the Farmers' Register, Petersburg, or to the subscriber, directed to Garysville P. O. Prince George, Va.

EDMUND RUFFIN, Jr.

Coggins' Point, May 31, 1839.

NO-BONE

BREED OF HOGS.

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THE

FARMERS' REGISTER,

A MONTHLY PUBLICATION,

Devoted to the Improvement of the Practice

AND

SUPPORT OF THE INTERESTS OF AGRICULTURE.

EDMUND RUFFIN, EDITOR AND PROPRIETOR.

Vol. VII. JUNE 30, 1839. No. 6.

And he gave it for his opinion, "that whoever could make two ears of corn, or two blades of grass, to grow upon a spot of ground where only one grew before, would deserve better of mankind, and do more essential service to his country, than the whole race of politicians put together." *Swift.*

PETERSBURG, VA.

PUBLISHED BY THE PROPRIETOR,

1839.

[This publication consists of *four* sheets—postage for 100 miles or less, 6 cents—over 100 miles 10 cents.]

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June 20—tf

THE FARMERS' REGISTER.

Vol. VII. JUNE 30, 1839. No. 6.

EDMUND RUFFIN, EDITOR AND PROPRIETOR.

THE CULTURE OF THE POTATO.

By Mr Towers, C. M. H. S.

From the Quarterly Journal of Agriculture.

"The subject of the potato culture is yet quite open to the experimenter. Experiment on it by all possible varieties of ways is our advice; and when a sufficiency of facts have been collected, we shall then, but not till then, be warranted in theorizing on the nature of the potato plant." It is neither loss of time, nor useless repetition, to copy verbatim the closing paragraph of the editorial note, p. 110 of the last number, 41; for, by so doing, attention may be rivetted to a very grave subject, and also to the other papers, in the same number, to which the note refers.

Considering the admonition to experimentize in all possible varieties of ways as most sound advice, I believe that I shall be acting in accordance with it, by entering into a detail of the various methods of culture which I have pursued during a period of eight or more years, and noting down, as far as existing documents permit, the corresponding results. I will premise that, previous to 1830, my practice was regulated by that of ordinary cultivators in the west of Wiltshire, where I then resided; but that subsequently, in consequence of the frequent intercourse by letters with the venerable (late) President of the London Horticultural Society, and of receiving numerous varieties of potato from that gentleman, the product of his own unremitting experiments, I altered my practice, and have met with great success. At the period when the public press was burdened with alarming notices of "failure," I never saw an unhealthy plant, with one most singular exception, which I will, in its place, adduce as such. If this article fail to announce, or give weight to any new and important facts, it will, at the least, offer a pledge of what has been, and may again be successfully attempted. The opinions and theory of the lamented president shall be referred to, and thus the reader will be placed in possession of some valuable extracts from original letters, which are by me esteemed very precious relics, for they are now all that remain of one of the most candid, liberal, unselfish minds that ever adorned the world of science.

In the cultivation of the potato, the chief object ought to be the production of the utmost quantity of that mealy substance which constitutes the nutritive property of the root. This substance was formerly called the *farina*, a term which, if referred to qualities resembling those of meal or *flour*, can by no means be admitted, because of the total absence of that peculiar *gluten* which distinguishes the flour of grain, and qualifies it to undergo the panary fermentation, and become bread. *Amylum* and starch, on the contrary, are correct terms; and with this remarkable substance the potato abounds, but to a greater or less extent, according to the ground in which it grows, and to the routine of culture to which it is subjected.

By the analysis of Einhoff, referred to by Sir H. Davy, in his agricultural lectures, the following results were obtained:—

From 7680 parts of potato—

Of starch (*amylum*) - - - -	1153
Fibrous matter, analogous to starch	540
Albumen - - - - - -	107
Mucilage, in a state of saturated solution - - - - -	312
	2112
Residue, or loss, must have been worthless fluid= - - - - -	5568

Thus the starch, to the extent of about 1700 parts in 7680, constitutes the chief material of food, because the mucilage in solution, represents only just so much gum-water, and the *vegetable* albumen can hardly be admitted to be equal to a like quantity of the "white of egg," *animal albumen.*

My own more simple and familiar analysis, described in the 'Domestic Gardener's Manual,' under the article "*The Potato*," gives, from eight pounds of washed, but unpeeled potatoes, finely rasped,—

	lb.	oz.
Of amylum or starch - - -	1	6
Of pulp, after pressure by hand -	1	11
Loss in water, or soluble matters -	4	15

The amylum, whether it exist in the state of powder, or in the form of "*fibrous matter* is the substance which confers excellence upon the vegetable. Potatoes will grow in any soil, from that of the loosest sand, if it be united with some reduced vegetable matters, to the strongest clays of agriculture; but what is of still greater moment to the subject under consideration—the produce in amount or quality appears to be materially influenced by local agencies, even in soils of the same constitution. Thus the sands which bring fine mealy tubers in Somersetshire, fail in other quarters of the kingdom. On this ground only can we account for the discrepancy which we meet with in the papers of the many cultivators who have given publicity to their practice and opinions; one asserting that the light and dry lands bear the best crops, while another maintains, that stiff and clayey soils are most congenial. The operations of soils, therefore, are contingent; and it is proved, almost to a demonstration, that potatoes which are excellent in West Wiltshire, as for example, the varieties there termed the "early purple-eyed," and the "Princes beauty," became deteriorated in Berkshire, treat them how you may. Lancashire is famed for its varieties which boil to a meal that crumbles under the fork, and is nearly as white as flour, but the varieties change in the midland and southern counties. That soil, and routine of culture, which produces the strongest haulm, and most expansive system of foliage, will yield the greatest bulk of tubers; hence the opinion which we constantly hear expressed, "*that the potatoes run away into haulm,*" is a fallacy, because experience proves, what physiology teaches, that the tuber is the product of the foliage, by the quality and breadth of which its comparative substance is regulated. But experience and facts also demonstrate, that when the foliage is rendered *too* massive, and the stems become too high, and therefore unable to support the weight of a luxuriantly rank herbage, the tubers, though large in size, numerous, and weighty, are poor in quality, deficient of amylum, and frequently hollow. *A medium growth*, wherein the balance of strength is supported between the stem and leaves, is the result of a well prepared and healthy soil, reciprocating with the stimulus of the sun's rays, and the decomposing agencies of atmospheric air, and of water. Such a soil will yield sound tubers, be it sandy, light, and easily pulverizable, or unctuous and adhesive. And on these grounds, quality, *firmness* of texture, and *mealiness*, ought to be the standard, rather than weight of tuber. Thus, in the west, we find the return from the seed sown in the sands, however sound and excellent it may be, is still little more than half what may be, and is produced in the rich loams of Berkshire. In the latter, I have been told of 700 bushels, of 60 lb. each, from the statute acre; whereas I have seen little more than from half to three-fourths of a bushel, digged up from the rod or perch, in the grey sands of Wilts, which is in the proportion of little more than 100 bushels per acre. Mr. Knight has calculated that 1000 bushels, imperial measure, each weighing 80 lb., may be produced; and experiment goes far to shew what *can* be effected. Nevertheless, take one country with another, the utmost average might perhaps be rated at 300 bushels of ordinary weight, four bushels to the sack. To conclude this view of the old treatment, and its results, it will be only needful to state, that potatoes of the smallest medium size, were cut into sets, each containing from one to three eyes—the rose, or crown ends, being frequently rejected; the sets were then suffered to become dry under a shed; the starch setting and coating the wounded surfaces, and the texture becoming soft and flaccid, in consequence of the emptying of the cellular tissue by evaporation. Could robust growth, or large healthy produce, be reasonably expected to result from treatment so diametrically opposite to sound philosophy? *Disease*, however, is not now contemplated—*that*, perhaps, was purely local and epidemic; but it were as rational to expect vigor and strength by the operation of agents purely debilitating, as to hope for great bulk and prolificity, from mangled fragments of tubers, rendered inert by exhaustion.

My correspondence with Mr. Knight, upon the subject of potato-culure, commenced in 1831. A letter dated 4th February of that year, is now before me, and from it I extract the following connected particulars entire. These, I imagine, will now prove a source of valuble information to others, as they did to me, at the time when I derived the first correct knowledge of that improved culture, which must finally, if it be duly appreciated, supersede the old and faulty routine.

"I obtained," said Mr. Knight, "from the *ash-leaved kidney*, last season (a bad one), a produce equal to 670 bushels, of 80 lb. each, per statute acre; and I entertain no doubt of having as many this year. To obtain these vast crops of the ash-leaved kidney, I always plant them *whole*, selecting *the largest* I can raise, and from *very early crops:* those ripened early in the preceding summer are kept dry. I usually plant them upon their *ends*, to stand with the *crown end* upwards, and place them at four inches distance from centre to centre in the rows, and the rows two feet apart, and always pointing from north to south. I plant my large potatoes much in the same way, but with wide intervals, according to the height which the stems acquire.

"Thus I plant 'Lankman's' potato" (a noted variety, then, I believe, the subject of experiment), "which grows a yard high, at six inches distance from centre to centre, and three feet six inches, or four feet between the rows; *never cutting any potato*, nor planting one of less weight than a *quarter*, but generally *half a pound*. By using such large sets, I get very strong, and large plants, with widely extended roots, early in the summer; and I begin working, as it were, with a *four-horse*, instead of a one-horse power. I do not despair of getting 800 bushels of pototoes from an acre of ground, if I live long enough to see the produce of some new varieties, which I have formed, and which are of very vigorous growth, whilst they do not expend any thing in blossoms. The *blossoms take away a good deal of sap*, which may be better employed in forming potatoes; and whenever a potato affords seeds freely I think it almost an insuperable objection to it. As a general rule, I think potatoes ought to be planted in rows distant from each other in proportion to the height of the stems; the height of the stems being full three feet, the rows ought to be four feet apart, and the sets (tubers) of the *very largest varieties* planted *whole*, never to be more distant from centre to centre than six inches. By such mode of planting, the greatest quantity of leaf (the organ in *which alone* the vital nutritive fluid is made) is exposed to the light. I have this year obtained many seeds of the ash-leaved kidney potato, crossed with another early variety, from which I expect some valuable early varieties, though I scarcely hope to get any thing preferable to the ash-leaved, *if that would not wear out*."

The foregoing passage may, I conceive, be regarded as a compendium of philosophical culture. The extract which follows, is from a letter dated 5th July in the same year; it contains interesting observations on the means to accelerate or retard a crop of potatoes. Speaking of the earliest variety, Mr. Knight observed—"The tubers which have ripened early in one season, are alone proper to plant for a very early crop; those which have ripened *late*, being not sufficiently *excitable*, though more eligible for a late, or rather a moderately early crop, the produce of which will be proper to plant for a very early crop. By attending to these circumstances, and by planting tubers large enough, and near enough in the row, with proper intervals between, according to the height to be attained by the stems, you will be able to obtain much larger crops per acre, than are usually obtained."

As respects the age or condition of seed-tubers, Mr. Knight says—"Potatoes somewht immature, are quite as good for planting in the following year, as others; and in some cases, perhaps in many, better: for, a particular disease, formerly well known under the name of '*curl*,' appeared on plants raised from mature tubers, and not from those raised from immature tubers."

During the years 1830-1-2, Mr. Knight had raised, by cross impregnation, a great many varieties, fourteen or fifteen of which he sent to me, as specimens: they all possessed the characteristic mark of excellence, which it was the object of the originator to attain—that of *developing no perfect flowers*; the flower-stalk would rise with its germs of blossom, but these would suddenly become yellow, and fall off, without expanding, consequently the plant had all its energies devoted to the subterranean expansions. Of the enormous yield of several of these varieties, I hold by me the written proofs. One which was numbered 4, Mr. Knight states to have produced 23 cwt. 1 qr. 76lb. per acre!

With these, and other facts before me, it was natural that a course of experiments should be immediately instituted; and these have been persisted in, with some modifications to the present day. My practice, therefore, differs from that of every ordinary cultivator, and its results, which will now be stated, cannot be reckoned unsatisfactory. I have not, however, adhered rigidly to the system of Mr. Knight, in planting entire tubers, because it sometimes required more seed-stock than could at all times be conveniently spared. But there are cases which require certain modes of practice, and these ought to be clearly understood by those who cultivate several varieties. A few lines will render this sufficiently clear.

Every county has its own peculiar favorites; and local names are applied, which make it difficult to identify varieties. All persons, in England at least, appear to understand and appreciate the qualities of the early *ash-leaved kidney potato*, and therefore I assume it as a standard for the treatment of varieties intended for the earliest summer supply of the table, rejecting as irrelevant to the present inquiry, any reference to artificial excitement, either by frames, and glasses, or by warm beds of fermenting materials.

The growth of every plant must imply the production of heat, and of this heat there are ample sources to be found in the decomposition of water, and vegetable or animal matter in the ground, by the agency of that enormous volume of the electric elementary fluid, which holds the constituents of those substances in a state of natural union. In planting the ash-leaved kidney, it is my practice to provide for early developement, and ample security from spring frost, by digging trenches six or eight inches deep, and nearly a foot wide, throwing the earth in the form of a ridge on either side of the trenches. Into the soil, at the bottom of each trench, three or four inches of half decomposed stable manure, with leaves, used for linings, are digged, and then a little light earth, if required, is raked in, sufficient to leave the surface, when settled, about four inches below the level of the ground. The ash-leaved potato has very few eyes, therefore it is desirable never to cut it into sets; the potato is pressed into the soil, upright, the eyes being uppermost, and the potatoes standing five inches asunder, according to the directions by Mr. Knight. Earth from the ridges is drawn over the crowns, to the depth of an inch, and occasionally half an inch of sifted ashes, or of light linings' manure is superposed, thus making the first covering an inch and a half deep.

It is the usual method to place the potatoes, or sets, four or five inches below the surface of level beds, and when the shoots appear, to draw earth to the stems. But by the trench-planting, which may be performed in March, or even earlier, the crowns and advancing buds are quite sufficiently protected from the frost, unless it happen to be of very severe character, and then an inch or two of light litter may be laid in the trenches. The great mischief, however, which befals the earliest plots, is occasioned by frosts in May. Now, the trenches afford protection to the tubers, while under ground, and as soon as the shoots are seen above the surface, fine earth is raked or hoed from the ridges, so as to cover the first developements. As the shoots advance again, more earth is drawn down, till at length, the trenches being filled, the level of the surface is again produced, and with it a sufficient and ample depth of earth is afforded to the tubers, and their fibrous processes. All then that remains to be done, is to dig the ground between the rows, to the depth of three inches, sufficiently to give freedom, and openness of texture. I am averse from ridging and earthing-up, as I can see no utility in it, and never once found an additional potato from its adoption. I have seen whole ranks of potatoes blackened by the frost of an hour or two; and even in the present season, have been told that great destruction was produced by the frost of the 16th of May. My thermometers gave proofs of at least six degrees, but the potatoes remained safe; and if any persons be inclined to cavil against the practice recommended, I can only, in self-defence observe, that frost has never hurt me;—my potatoes have lost no shoots, have run their course uninterruptedly, and have evinced neither failure nor disease.

In 1836. March 16 to 19.—Four rows were planted, in trenches between single asparagus rows, and about eight feet asunder; they yielded 72½ lb., from 12¾ lb. of seed-tubers.

In 1837. March 3 to 7.—Twelve pounds were set in a single trench, twenty-four yards long—abreast, and four feet in advance of a wall, with an aspect south by east. From this row were digged 72lb., of excellent flavor. In planting this variety, I have never been very particular as to the direction of the rows, but have placed them widely asunder. The yield has rarely exceeded six times the weight of the seed. There are so few eyes in this potato, that extensive herbage cannot be expected. Indeed, on some occasions, blanks were observed; yet a progeny of potatoes was found to have been produced, without the protrusion of any superficial herbage. It is, however, of great moment to protect the foliage from frost, as soon as it becomes visible, because a shoot lost cannot so readily be re-supplied, as it is by other varieties, prolific in eyes. I am aware that I have trespassed considerably upon the time of the reader, on a subject not strictly connected with the farm; yet it appeared essential not to overlook the garden varieties, in an article which is designed to furnish a standard of comparison. I pass, however, to the store varieties, without further remark.

Winter potatoes.—Such are all that are not digged for use till after Michaelmas, and of these every county, nay almost every parish, has its own peculiar favorite. Some, however, are in prime condition before, and two months subsequent to Christmas, while others ought not to be cooked till April. I lately cultivated a round potato, which bore the title of Cornish rough-red. It was hard as a cricket-ball, and almost as round, and never started an eye till June, while it remained out the soil. The pushing of the eyes affords a pretty correct guide as respects the time when a potato is in season, and when it ought to be planted. If during the winter, the tubers be kept in a dry cave or pit, where the utmost degree of equable cold can be maintained, consistent with the exclusion of actual frost, the quality and flavor will remain more pure than when they are covered by any moist or fermentable material whatsoever. If, under this simple, unexciting treatment, any variety protrude its eyes, that variety is not *a keeper*. This is the only complaint which can be advanced against that truly excellent, and widely cultivated potato—

The Early Shaw.—Its skin (*testa*) is of pale buff, covered with a rough, russety membrane, and herein it differs from the *Champion*. Both of these capital varieties possess the defect or vice of blossoming and fruiting copiously; yet they are too finely-flavoured to be rejected. In all countries there are *kidneys*—red, white, or mottled, which possess qualities adapted to soil and atmosphere; but with the exception of Mr. Knight's crossed seedlings (of which the *Downton Yam* is a fine specimen), I know of none that cast the blossom-buds ere the flowers expand.

All these medium and long keepers are furnished with a number of eyes, distributed over the greater part of the surface, yet abounding most at that end which is opposite to the point where the organic process, or funis entered, which supplied the tuber with nutriment derived from the parent stem. The end where the eyes are chiefly congregated, is termed the rose, or crown, while that which was connected with the parent, is termed the root-end. Many persons reject the former, believing that it produces too much haulm. But the fact is, that as in the shoot of a tree, if one or two good buds break, they push on, leaving the inferior buds silent and unexcited. Thus, rejecting the root end, it is advantageous to cut a large potato that abounds with eyes, into sets, to comprise not fewer than *two*, nor more than *three* eyes; and in cutting, to distribute the crown eyes fairly, as may be, among other eyes situated below them, by making the cuts in a diagonal direction. I know, by experience, that Mr. Knight acted upon sound and secure principles, when he recommended the planting of entire tubers, because he knew well that an ample yield might be assured, one or more of the eyes of each being certain to break. Moreover, in the event of that shoot or shoots being cut off by frost, other eyes, till then inactive, would be ready to produce successional shoots.

Two facts of importance in physiology, now present themselves to our notice: *First*, All the eyes of entire potatoes do not push at one time, therefore it is a mistake to suppose, that a plot becomes crowded by useless haulm, if the potatoes be planted whole. *Again*, persons have imagined, that weakness of the root is occasioned by the destructive action of frost upon the earliest shoots; this also is a mistaken notion, for, if any eyes remain unexcited in the tuber under ground, the loss of one shoot is speedily supplied by the substitution of another. Time indeed may, to a certain extent, be sacrificed, but that is all. Of this any one may convince *himself*, by endeavoring to exterminate a straggling potato; he may hoe, or pull off the first shoots, and think his ground cleared of the intruder; but in a week or two, the spot will be again occupied, and it will be perceived, that nothing short of the complete removal of the tuber can prove effectual. If ***sets***, with one or two eyes, have been planted, and have sent up all their shoots, then the destruction by frost may prove fatal; but it may happen, that a shoot shall appear to be killed to the ground, and yet produce a fruitful plant, though late in the season, from embryo eyes seated around the stem, near its point of emersion from the potato.

Since it appears a demonstrable fact, that *whole potatoes* rarely *develope* all their eyes, it becomes a question of economy, whether it be not better to plant *cut sets* of the keeping varieties. Many persons cannot spare a large stock for seed; and in that case, it will be prudent to employ sets, with two or three eyes, taking especial precaution to guard the plants from late frosts, and promoting the utmost activity of vegetation, by a wise system of culture; the general principles of which are found in the extracts before given, from the letters of Mr. Knight.

These principles refer chiefly to the influence of *light upon* the foliage, and it certainly is a fact, that by making the rows in the direction of north and south, the sun at mid-day shines along the entire line, exerting his greatest power of attraction, in a way which tends to retain the upright position of the haulm. But there are other considerations which refer to *soil* and *nutriment*, and these must be always kept in sight.

The texture of the soil should be naturally free, if possible; but as the desirable medium is not always at command, it will be prudent to set up heavy land in ridges, during the autumn, to expose a great surface to the frost. The manure required should be introduced at the same time, with a quantity of seacoal ashes, if obtainable. Sand, even in excess, will frequently fail to meliorate heavy, binding earth; but ashes, which contain a large proportion of finely divided silex, some red oxide of iron, and a little alkali, produce the happiest effects. In alluding to this autumnal preparation, I have a double object in view, dependent upon the habits of the potato. The plant affects a light and moderately enriched soil, wherein its fibrous roots, and tuber-bearing processes may wander laterally, but not deeply; therefore, whether the plough or spade be used, the manure ought to be blended with the earth prior to its being thrown into ridges. that the whole mass may be mellowed by the winter's exposure. Six inches of well laborated earth, over a more solid subsoil, is amply sufficient for the play of the roots, consequently, the ridges ought to be raised to the height of twelve inches. After the winter, the soil cannot be too much broken down, nor the manure too intimately incorporated with it; but for these purposes a dry season should be chosen, otherwise the labor of the previous operations will be thrown away, and the main object defeated. I believe that the quality of potatoes is much injured by strong recent manure. Autumnal preparation effects every purpose; the manure is elaborated, but not dispersed; it loses rankness, but is brought to the condition of what is fancifully called *humus*, a hydro-carbonous substance, brought to a condition which fits it to supply vegetable aliment when exposed to the decomposing stimulus of the vital principle. *Sands*, however, ought not to be raised into ridges; they decompose manures rapidly, and whatever organic substances are applied to them in autumn, should be placed some inches below the surface. It has been shrewdly conjectured, that the straw to be converted to manure ought, as far as is possible, to be brought from land of an opposite quality: thus, if it be intended to meliorate a poor and sandy earth, the farmer should endeavor to obtain his straw from situations where the staple is a strong or clayey loam. Facts are wanting to establish the implied theory, but it merits investigation.

It was customary, as before observed, to keep the sets till much of the moisture had evaporated, and the substance became flaccid; this drying is perfectly needless, and may prove detrimental. It has been a regular practice with me to plant as wanted, fresh from the knife, row by row; and in order to absorb the moisture which exudes from the divided cellular substance, and at the same time to prevent the attacks of grubs and subterraneous vermin, the set has frequently been dipped into powdered lime, fine ashes, plaster of Paris (gypsum), as conveniently at hand. The lime has been recommended, and certainly no mischief of any kind has resulted from the practice. My potatoes, in garden, or field, have always done well, excepting, as I stated,in one solitary instance, of which the following is a faithful narrative.

A few potatoes, with a dark mulberry-coloured skin; but extremely white pulp, were planted, as a trial. From two or three, a number was raised sufficiently to plant one row, in the spring of 1835. On the same bed, and not four feet distant, another variety was set, at the same time, and in the same way. The plants of both rose without failure; but when the purples had attained the height of six inches, the foliage lost the healthy hue; it first changed to a purplish-green, then faded off to a sickly yellow. The ground was hoed, lightened by the spade, and every common means was resorted to, but vegetation could not be stimulated—the plants died; and at the season of digging, not a vestige of a potato remained,—the destruction was total. As every other variety remained healthy, and yielded fairly, and as the soil appeared in good condition throughout the season, no one existing or traceable circumstance tended in any degree to elucidate the mystery.

I have never seen nor heard of that variety since; and it is just possible, on the theory of Mr. Knight, that its term of life was come, and *extinction* the consequence.

Entire potatoes were used by me during two or three seasons subsequent to the receipt of Mr. Knight's specimens, and I selected tubers, of the average weight of *four* ounces, always placing them upright, and regulating the rows, and the distance between the tubers, by the ordinary height of the haulm. As the stems advanced, earth was drawn against them,till at length it formed complete ridges, a foot high on the two sides. Good crops invariably resulted from powerful and healthy growth; but the yield never corresponded with the great bulk of seed-tubers planted, for it averaged about a six-fold proportionate increase. Thus, if 8 lb. were set in a row five yards long, the crop produced would weigh about 48 lb. In 1835 I adopted the practice of planting sets, with the exception of those varieties, early or medium, which are naturally furnished with but few eyes, situated about the crown. I found the yield to be quite equal to that obtained from entire tubers, so that the weight saved was strictly an economy of seed-stock. I believe this remark may be applied even to ash-leaved kidneys, wherein the lower, or root-ends, have very seldom any good eyes; and that of the rose ends, with an inch of the pulp of the potato below, were cut as sets, two-thirds of the substance of tubers might be saved for the table; but the experiment remains to be tried. From the annexed statement of the plantings and proceeds of 1837, some opinions, however, may be formed on the subject; and if ash-leaved potatoes can thus be economized, a considerable saving of expense will be effected, as the dealers sometimes demand ten or twelve shillings per bushel (often not weighing above 52 lb.) for seed potatoes.

Experiments of 1837.

1. A long, *medium early potato*, a variety of kidney, which assumes curious twists, and curvings. The tubers become very large occasionally, but appear to be always of superior quality. This potato is good at any season, from the time of digging, in September, to June following. There were planted, in trenches, 26 lb. of whole potatoes.

12 lb. in the garden, between March 30, and April 5.

14 lb. in an orchard plot, April 6 to 8.

The total yield from these 26 lb. was 354 lb.

2. In the orchard, at different dates, between April 8. and 24.—

Early Shaws, chiefly cut sets of 4 oz. tubers, two and three eyes, limed; a few 2 oz. whole tubers, were used separately—total 30 lb.

The crop was digged, November 6.—weighed 520 lb.

3. *Downton Yams.*—(Knight's). The seed from three or four years succession, in my own garden, or field. Cut into two and three eyed sets, 22 lb. 12 oz.

The crop digged at the same period as the shaws —215 lb.

4. *Early Champions.*—Their first crop, being an exchange with a person whose soil is extremely different from mine. Sets cut by division of the tubers from the crown to root end, picking out the central eye, and after liming, laying the cut sides downward, so that the broad surface of eyes lay uppermost.

Sown April 20. 13 lb.—Yield in November, 150 lb.

5. *A reddish-brown* white *mealed-kidney*, which I have reason to believe was originally brought from Wales, by the late Pascoe Greenfell, Esq., new to me at this planting; received from a distance. The eyes are numerous, and pretty equally distributed; therefore the potatoes were divided *transversely*, so that there were crown-end and root-end sets in different rows. The actual comparative result was not, however, ascertained, because the man employed, did not notice the markers, at the time of digging, and mixed the whole crop. By this oversight, I am prepared only to state, that from 24 lb. of these kidneys, I obtained a return of 356 lb.

It is now left to the experience of the reader to determine whether these crops surpass those of common culture; and it remains to observe, that all the early varieties were trench planted, and among those, I includethe first variety of kidney, at the head of the list. The keepers (2-5) were planted row by row, during the process of digging and the rows generally four feet asunder. Thus the ground, which had previously been under *broccoli*, was digged to the extent of five feet; then a line being stretched, a drill-trench was chopped down with the spade, drawing the loosened soil forward six inches deep. The sets were herein deposited, five or six inches apart, and were covered with earth made very fine and light; then another space was digged, and a second trench struck out and planted. I have, in the present season, made a further improvement, by sprinkling an inch-deep layer of light hot-bed manure, over the surface of the ground which covers the tubers; thus each row is clearly marked, the soil protected, and enriched, to the width of a foot, without bringing manure into contact with the potatoes. After a time, when the haulm has become six inches high, the intervening spaces are fork-digged, or the soil otherwise, by hoe or spade, rendered light; the little manure which remains is thus intermixed with the surface, and about two inches of earth is drawn over it, and against the stems on each side; this is all the earthing I allow. The soil remains loose and free at top, over a more solid stratum beneath.. This is the actual condition the plots are in at the moment of writing (July 29).

It has been conjectured by many, who have accordingly adopted the practice, that potatoes may be planted year after year in the same land. I have never risked the trial to an extent sufficient to decide the question, and, indeed, the difference of soil would at once throw an obstacle in the way, which could not be surmounted; but as far as I have seen, a loam constituted as mine is, does not appear to bring two successive crops of the same potato to a corresponding degree of perfection. It is not to be doubted, that all plants convey into the soil matters either gaseous, fluid, or solid—for the odor diffused will prove the fact to a demonstration; therefore, without dwelling upon the theory of radical, fecal exudation, or claiming the admission that, by analogy, whatever a plant *throws off from its system cannot become salubrious food for another of its own species*, it certainly appears reasonable to vary the crops according to the order of rotation, either in the field or garden. I have acted by this principle, and, whenever it has been in my power, have planted one or other of the cabbage family after potatoes.

But in reasoning by the rules of rotation, we must not be led away from particular facts. The tubers of the potato-plant do not appear to derive support from the soil, they being appended to processes which are conduits of supply downward or laterally from the leaves and stem; the sap-fibres which convey the fluids upward are wholly independent of these processes. Just in proportion to the amplitude of foliage, duly exposed to the sun and air, is the bulk of the crop; hence, although manure, *or humus*, becomes decomposed by the action of the proper roots, and is by them conveyed in the form of raw sap to the herbage, the ground does not become impoverished by the potatoes themselves, however numerous they may be, they being organic bodies (*propagines*), or system of life—a congeries of new plants imbedded in a pulpy and amylaceous mass, which has no connection whatever with the soil. Hence, also, as the potato is thus viewed as a product of the leaves, it becomes the recipient of the exudation, which it thus prevents from contaminating the ground to any considerable extent; and thus, upon the theory of fecal exudation, the potato may be planted year after year on the same spot of ground, with comparative *safety*, but by no means advantageously.

Little remains to be said. The crops I have produced, and their excellent quality, prove, that the rows may stand widely apart, and thus furnish ample space for the horizontal expansion of the radical processes, without causing any diminution of the yield; for what is lost in space one way, is made up by the proximity of the sets in the rows.

The loam (as a staple, naturally) is composed chiefly of a *gritty gravel*, containing a little chalk, more iron, and a moderate portion of alumina—the matter of pure clay; its vice, is the condition of the sand, or siliceous constituent, which renders it binding, under the influence of a hot sun, after rain. A *perfect loam* requires the silex to be in a state of minute division. If this fine silex abound, even to the extent of five-sixths of the whole bulk, leaving the remaining sixth to be composed of alumina, sub-oxide of iron, of a light ochre tint, and chalk (*carbonate of lime*,) the loam will be rich, unctuous, and of high quality; but if a considerable portion of the silex is coarse (the detritus of gravel), the texture of the loam becomes vitiated, and it sets like a brick. Those loams, wherein the iron exists in the form of a per-oxide, assume a purple, or red tint; they are abundant in Somersetshire, and are the staple of permanent fertility.

Agriculture, or the science of cropping and rotation, will never be duly understood, till the constitution of all loams, and their power of decomposing manure *under the stimulus* of the *vital, vegetable* principle be accurately determined by experiment.*

ESSAY ON VEGETABLE PHYSIOLOGY.

[Continued from page 271.]

CHAP. XII.

NATURE OF THEORIES. THEORETICAL ORIGIN OF THE FLOWER. METHOD OF RENDERING BARREN TREES FRUITFUL.

For the Farmers' Register.

In treating of natural phenomena, we very frequently suppose a cause from which they may have arisen, and, for the time, considering this as the true cause, proceed to point out the manner in which they must have been produced. Where the phenomena result so naturally from the supposed cause, as to render it highly probable that it is indeed the true cause, we call the supposition a *theory*; where they do not thus naturally result, but still, without doing any great violence to reason, may be considered as resulting from the supposed cause, we term the supposition a *hypothesis*. Theory and hypothesis do not differ from each other in their essential character, but only in their degree of probability. A hypothesis may be looked upon as a probable theory; or a theory, as a very probable hypothesis. When we account for any phenomenon, by tracing it to the cause supposed in theory, and assigning the manner in which it must have been produced, in case the supposed cause be the true one, we are said to treat the subject theoretically. Such is the meaning of these terms, when strictly used in treatises on natural science. We sometimes, though more rarely, use them in a looser way; meaning by theoretical reasoning, the assigning of a cause, and tracing out its operation, in general, when the cause is known to be the true one, as well as when it is only a supposed one. It is so much easier to remember any number of facts when we have in this way connected them together, than it is without such connexion, that these suppositions are found to be of essential service to the student, both in acquiring the facts in the first place, and in retaining them afterwards. And beside this, we may almost always, by reasoning upon our supposition, ascertain facts, which were not known before. If our supposed cause so nearly resembles the true one, that known effects seem naturally to arise from it we might conclude *a priori* that other effects which would arise from the true cause, will seem naturally to arise from our supposed one; and that thus, even though our supposed cause be not the true one, we might, by reasoning upon it, learn facts of which we should otherwise remain in ignorance. And such is found to be the fact. There is no truth more clearly taught, by the history of natural science, than that theory and hypothesis are two of the most efficient instruments which man can make use of, in extending his knowledge of nature. Much objection is often felt and expressed against theoretical discussions, from a misapprehension of their true character. The scientific writer in advancing a theory, and tracing out its application to the subject in hand, does not intend, that it shall be received as a constituent part of our knowledge of nature, or that it shall be placed upon a footing with the facts of science; but only as something which may be supposed, for the purpose of facilitating our acquisition of knowledge, and to be used for increasing the amount of that knowledge. Whether the theory shall, in the end, turn out to be true or not true, so long as it agrees well with known facts, it may be used with great effect in extending our knowledge of nature. We should always, however, remember, that it is nothing more than a supposition; and of course, hold ourselves in readiness to give it up, the moment a more probable supposition is advanced.

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* When Mr. Towers was explaining the character of the *Ægrostis segetum*, in p. 89, of this volume, we expressed a doubt of the insect described being an Ægrostis. It is but justice to Mr. Towers to take this opportunity of stating, that from the facts which he has since furnished, regarding the character of the insect he described, we are quite satisfied that it *is* the *Ægrostis segetum*, and no other.—EDITOR.

I have thought it advisable to say thus much on this subject, as I purpose, in the present chapter to give the commonly received hypothesis respecting the origin of the flower. I should leave my examination of the flower incomplete, as well as fail to give some information respecting it which is curious, and of considerable practical importance, should I pass on without giving, at least, an outline sketch of this theory. If any one will advance a more probable theory, or one, which agrees better with known facts, I for one, will give up the present theory, so soon as I am satisfied that such is the case.

This theory may be briefly stated thus: A flower, and all that springs from it, is nothing more than a transformed branch, including under the term branch, not only the axis or stem, but also its appendages, the leaves. This transformation is supposed to take place by the abortion, degeneration, or adhesion of the different plants of a branch. In supposing the transformation to be effected by the operation of these three several causes, we are not assigning any other causes than those which we see in operation every where around us. The term abortion, would seem to mean, that a part soon after its original formation, became deformed, and ceased to have the power of further developement; but such is not the sense in which botanists use it. "By abortion, they mean, the non-appearance of an organ at the place where one would expect that it would appear, and where, in fact, it would be found if the structure were regular." Instances of abortion in the organs of vegetables, must be familiar to every one at all in the habit of observing nature. Degeneration, consists in a part being less fully developed than is natural. Degeneration is a much more frequent source of alteration in the appearance of plants than abortion. That the different parts of a plant may degenerate, we have proof in the falling off both in quality and quantity of those which are cultivated by man, when they grow in circumstances unfavorable to their full developement. The operation of this same cause may often be detected, where at first thought we would not suspect it. The thorns on a wild crab apple-tree, are nothing but degenerate branches; that such is the fact is proved by an exexamination of their position and structure. They are situated just at the points at which branches would normally have appeared. They always, whilst young, bear leaves, and these leaves are situated with respect to each other just as the leaves on a branch are. But the most satisfactory proof is afforded in the fact that when one of these trees is removed, and placed in circumstances more favorable to its growth, not another thorn will be produced upon it, and often its old thorns will be converted into true branches. Adhesion, or the growing together of parts, is a much more common source of alteration, than either of the other two. Of the operation of this cause we have instances in the accidental growth together of two cucumbers, or of two apples, or of two or more stems which have sprung up very near to each other. Indeed the life of every graft depends upon its adhesion to the stock. In assigning abortion, degeneration, and adhesion as causes by which the transformation of a branch is effected, it is evident we are not assigning causes which are merely supposititious ones; but such as we do, in fact, see in operation around us.

But are the changes, which it is necessary that a branch should undergo, in order to be converted into a flower, such as we ever see to take place in plants? In answer to this question, it might be sufficient simply to mention the well-established fact that any branch of a steril tree may be made to produce flowers and fruit by removing a ring of its bark near the point at which it is inserted in the stem, and this after the leaf-buds have begun to be formed. Or, to state the case a little differently, but in a way in which it has often been put to the test of experiment, and uniformly with the same effect—two young apple trees may be growing side by side, trees which if left to themselves will never bear fruit before the 7th or 8th year; if from one of them a ring of bark be removed near the root, and not from the other, the succeeding summer the first will bear flowers and fruit, whilst the second will not; and the flowers and fruit of the one will be found on just those parts of the stem where branches have grown on the other. Now this effect will be produced if the ring of bark is removed after the buds have begun to be formed. In this case it is evident that those buds which in ordinary circumstances would have produced branches, have been actually converted into flowers and fruit.

Let us now inquire what are the changes which it is necessary that the leaves should undergo in order that they may be converted into the different organs of the flower and fruit. In order that a number of leaves may be converted into a calyx, a change in position is necessary, and generally a slight change in form. If we take two pairs of opposite leaves, and suppose the internode, or part of the stem which intervenes between them, to be destroyed, or what amounts to the same thing to fail to be produced, we shall have four leaves occurring in a circle around the stem. Let these undergo a slight transformation, and they will form a four-sepaled calyx. If we suppose them to adhere or grow together at their edges, for a part of their length, instead of a four-sepaled calyx, we shall have a four-parted one. In order that a number of leaves may be converted into a corolla, a change in color, and the same changes in position as in the case of the calyx, are necessary. A petal is nothing more than a refined leaf. Of the necessary changes in color, we have many instances in those organs which still remain leaves. The upper leaves of the balm (*melissa*) are always colored. The upper leaves of love-lies-bleeding (*amaranthus melancholicus*), are often of as deep and beautiful a crimson as the flower itself. It is not an uncommon thing in the tulip, to see one of the leaves growing near the flower, variegated with the same rich colors as the flower itself. In order that a leaf may be converted into a stamen, it is necessary that the expanded parts of the leaf on each side of the mid-rib should be abortive, and that the end of the mid-rib itself, should be developed so as to form an anther; and pretty much the same changes are necessary in order that a leaf may be converted into a pistil. The change of stamens into petals, and of petals into stamens, is one which very frequently occurs. The rose has naturally but four petals, or flower-leaves, as we see in the wild-rose and eglantine. All our double roses have been produced by the conversion of stamens into petals. It is very common thing to see a double rose with 30 petals; of these 30, 26 are metamorphosed stamens. In fact, in the double rose, we may often find the stamens only about half metamorphosed; having their anthers perfect but their filaments developed as petals. In some plants, this doubling proceeds so far that not only the stamens, but the pistils also, are converted into petals, as in the flowering-almond (*amygdalus nana*). In the double flowers of the flowering cherry we find the pistils actually converted into leaves. From the very centre of this curious flower, one and sometimes two perfectly formed green leaves make their appearance, by their position indicating that they are metamorphosed pistils. We sometimes meet with more remarkable transformations than these. In one instance, I have seen a stem growing from the very centre of a double rose and bearing a second rose upon its extremity. The germ of a pistil is the carpel, or fruit in the incipient stage of its growth. Of course, in the conversion of a pistil into a leaf, we have in fact at the same time an instance of the conversion of a carpel into a leaf. Thus it will be seen that the changes which this theory supposes are not so contrary to the common course of nature as we would at first be inclined to think; indeed that they are no other than such changes, as nature herself affords us numerous examples of.

Let us now attend to some of the consequences which must follow if this theory be true. 1st, it would follow that all the organs of fructification must have essentially the same structure. This conclusion agrees with the facts of the case as determined by examination. All the organs of fructification, the sepals, petals, stamens, pistils and carpel, consist of a vascular and a cellular system, arranged on essentially the same principles; the apparent difference arising principally from the more or less perfect developement of the cellular system. 2nd, that the number of organs of each several kind, should, in the same flower, be some multiple of each other. As all leaves are normally situated in whorls, and all the leaves of each whorl at the same height on the stem, and in the same situation with respect to the circulating sap, we would naturally conclude that all of the leaves belonging to the same whorl would be converted into the same kind of organs. The number of leaves in a whorl being definite, the number of organs of each kind, must be some multiple of every other. This is found to be true in a great number of flowers; thus the *hamamelis* (witch-hazle) has four sepals, four petals, four stamens and two pistils grown together at the base; the wake-robin (*trillium*) has three sepals, three petals, six stamens and three pistils; the cherry (*prunus*), has five sepals, five petals twenty or twenty-five stamens, and five pistils; the flower-de-luce (*iris*) has three sepals, three petals, three stamens, and three pistils, grown together at the base; the blood-root (*sanguinaria*) has two sepals, twelve petals, twelve stamens, and 2 pistils; the garden pea (*pisum*) has five sepals, five petals, ten stamens, and one pistil. When this, which is considered the normal structure of a flower, is departed from, the departure is to be ascribed to the abortion, degeneration, or adhesion, of one or more of the organs. In several flowers, belonging to the same natural division, we may notice a series of departures, thus seeming to evince a tendency towards the normal form; thus in the natural division of *scrophulariæ*, the *gratiola virginica* has five sepals, five petals, and two stamens; the *gratiola aurea* has five sepals, two stamens and two rudimentary stamens; the *digitalis*, five sepals, five petals, four stamens; the *pentotemmon*, five sepals, five petals, four stamens, and a fifth one imperfectly formed; the *verbascum*, five petals, five sepals, and five stamens. So generally is it true, that the number of each class of organs is some multiple of every other, that the botanist in determining the Linnæan class to which any small flower belongs, often counts the petals, and not the stamens. 3rd, That the several organs of fructification are severally convertible into leaves; and *vice versa*, that leaves are convertible into the several organs of fructification. Of the truth of this conclusion, proof has been already given. The circumstance on which the conversion of a leaf-bud into a flower, and thus into fruit, seems mainly to depend, is the accumulation of a large quantity of nutritious matter in the part to which the bud is attached. The elaboration of this nutritious matter, as has been already mentioned, is performed by the leaves. Hence it is, that a hyacinth, if deprived of its leaves one year, will not blossom the next; but if its leaves are so fully exposed to the light and air that they go through their growth in uninterrupted health, and if at the same time, the flowers of the first year are removed, the bulb will blossom more finely than ever the second year; for, in this case, not only is a sufficient quantity secreted by the leaves, but the stock prepared for the previous year remains unexhausted, in consequence of the flowers, which would have consumed it, having been destroyed. After a hot and bright summer, when the leaves have been in uninterrupted action, and a great quantity of solid matter has been deposited in the stem, an abundant quantity of blossoms invariably results; while the reverse takes place after cold and gloomy summers, when the shoots produced are weak and watery. If a tree is barren, its branches may be rendered fertile, by depriving them of a ring of bark, near the point at which they are inserted into the stem; this interrupts the backward flow of the elaborated sap causes nutritious matter to accumulate above the place where the bark is removed, and thus brings on the formation of flowers. An apple tree when raised from seed, and left to itself, will not flower in less than 7 or 8 years. But if a tree one year old, be cut off and grafted upon an old bearing tree which is able to supply it with a large quantity of nutritious matter, it will bear the second year after it is grafted; so that in this way, in three years a plant may be made to bear, which under ordinary circumstances, would not flower in less than seven or eight.

While the previous accumulation of nutritive matter in the part to which a bud is attached, seems favorable to its conversion into a flower, and thus into fruit, the abundant supply of nourishment through the roots, at the time when the bud is opening, seems unfavorable. This is illustrated by the fact, that in wet and warm springs, a great number of the blossom-buds of pears and apples are converted into leaves and branches. We account for this, by supposing that the excessively rapid developement which they undergo, breaks up the whorls of their flowers, and by throwing an excessive quantity of sap into the organs destined for flowering, converts them into leaves.

Such is the commonly received theory respecting the origin of the flower, and such the facts by which it is supported. Whether we adopt this theory or not, this much seems certain; that a leaf-bud, soon after its formation, may be converted into a flower, then into fruit; and also, that a flower-bud, in the early stages of its growth, may be converted into a branch and leaves. This is a fact of great importance to these engaged in fruit-culture, and European gardeners have long availed themselves of the advantages which nature thus affords. It is much to be desired, that we had a series of accurate experiments, performed for the purpose of ascertaining all the circumstances which affect these metamorphoses. That which is known, I have attempted to give in the present chapter; but it must be confessed, that it is too uncertain to be entirely satisfactory.

Chap. XIII.

SEED. THEIR STRUCTURE. MEANS OF DISPERSION. PROPAGATION OF CRYPTOGAMOUS PLANTS, EFFECTED BY MEANS OF SPORES.

The structure of the seed is very simple. In its most perfect form, it consists of an external coat, generally thick and hard, surrounding a cellular mass in which the rudiments of a new plant lie imbedded. The office of the external coat or skin is evidently that of protecting the more important and delicate parts within it. To this, its thick and hard structure is admirably adapted. In some seeds, this skin, or shell as it is more commonly called, is perfectly smooth, as in the acorn; in others, it is irregularly furrowed, as in the peach stone; in others, it is cross-banded; so as to resemble net-work, as in the seed of the prickly poppy. The marking of the surface of seeds is greatly diversified in different species, often rendering the minuter kinds beautiful objects of microscopic observation. When a seed germinates, the young plant has to burst through this shell, and in every instance, we find provision made for this, in the formation of the seed. Where the shell is very hard, it is always composed of two distinct and separable valves, as in the stones of the peach and cherry. The means by which the shell is broken, is the absorption of water by the cellular tissue of the kernel, through a small opening left in the shell itself. The force with which cellular vegetable matter expands, during its absorption of water, is almost irresistable. The common method adopted in France, of splitting out mill-stones from the quarry, may be mentioned as an example. The method is this: holes are bored around the piece intended to be split out; into these wooden plugs are tightly driven, and things being thus arranged, water is poured upon these plugs. The cellular tissue of the wood absorbs this water, and with such irresistable force does it expand, as invariably to split out the piece of rock intended. On the shell of many seeds we notice a scar; left by the separation of the seed from its funicle, or the vessel which originally connected it with the parent plant, and through which it received its nourishment. This is termed the hylum, or more commonly the eye. It is very conspicuous in peas and beans, in which it has a different color from the remainder of the surface of the seed.

Next to this outer skin or shell, lies the albumen consisting of a mass of cellular tissue, filled with nutritious matter. This is intended for the nourishment of the young plant, before its roots are sufficiently developed to enable it to gain nourishment immediately from the soil. The albumen is frequently divided into two or more separate portions, termed cotyledons. When the young plant protrudes from the ground, it sometimes carries these cotyledons with it, as in the garden bean, where they have the appearance of thick fleshy leaves. The most remarkable fact respecting the cotyledons is, that their number is found always to correspond to the structure of the plant which springs from them. The seeds of plants with acrogenous stems, such as ferns, have no discoverable albumen, and of course no cotyledons. Hence such plants are called acotyledonous plants. Those of plants having endogenous stems, such as the Indian-corn, have but one colyledon. Hence they are called monocotyledonous plants. Those of plants having exogenous stems, have always two or more cotylodons; hence these are termed dicotyledonous plants. The division of the vegetable kingdom thus indicated, forms the basis of Jussieu's natural system of classification—the natural system in common use among botanists at the present day.

Besides the shell and the albumen, a rudimentary plant, termed an embryo, always forms a part of the seed. This is the most important part of the seed, and for its protection, and future support, all the other parts are destined. The embryo makes its first appearance in the young seed, as a minute point or speck, in the midst of the pulpy matter of which the seed then consists. It afterwards gradually increases in size, deriving its nourishment from the pulp until it has assumed the appearance of an organized body, and reached its destined size. Having in itself, in a rudimentary state, all the essential organs of vegetation, viz., a root, stem, and leaves, it becomes a plant by the mere developement of its parts. When placed in circumstances favorable to its growth, it sends forth a root downwards, and a stem upwards, and feeding for a time upon the stock of food which the parent plant has laid up for it in the cotyledons, it strengthens and gains a firm foot-hold in the earth, and at length becomes a perfect plant. The embryo may be looked upon as a rudimentary plant, provided by the parent tree, with a certain stock of food, and thus sent forth into the world, to seek subsistence, and a home for itself.

Did the seed drop down from the plant on which they grew, and immediately bury themselves in the soil, great numbers would have to spring up in close contact, so that if they did not destroy, they would, at least, impede the growth of each other. This, however, is seldom the case; there is almost always some provision made for removing the seed from the immediate neighborhood of the parent plant, and dispersing them abroad in the earth. An examination of the means made use of for effecting this dispersion, presents a subject of interesting consideration. In some plants, the seed are contained in an elastic pod, or pericarp, which opening, when ripe, with a sudden jerk, scatters the seed to a considerable distance. Of this the Scotch broom (*spartium scoparium*) affords an example. During a dry day in August or September its pods may be heard snapping, at a very considerable distance. The wild touch-me-not (*impatiens fulgida*) affords another example. If its seed-vessel be touched when ripe, it at once bursts, and the valves, coiling themselves up, spring from the stem and scatter the seed around. The bursting of the pericarps of some species of pine, is also worthy of notice. The pericarp, which is a cone, remains on the tree till the summer succeeding that during which it was produced, the scales being still closed; but when the hot weather has commenced and continued for some time, so as to dry the cone thoroughly, the scales open with a jerk, ejecting the seed in every direction. But the *hura crepitans*, a plant of the West Indies, affords the most remarkable instance of this. "If the bony pod of this plant be bound with several folds of strong cartridge paper, it will, so soon as it become thoroughly dry, burst with force sufficient to tear this paper in pieces." We observe a different means of dispersion in the barley (*hordeum*.) "The awn of the barley grain, which is beset with a multitude of little teeth, all pointing towards its upper extremity, effects the movement of the grain away from the place where it fell. For when the seed with its awn falls from the ear, and lies flat upon the ground, it is necessarily extended in its dimensions by the moisture of the night, and contracted by the drought of the day; but as the teeth prevent its receding in the direction of the point, it is consequently made to advance in the direction of the base of the seed, which in this way, is often carried to the distance of many feet from the stalk on which it grew. If any one is yet skeptical respecting the travelling capacity of the awn, let him only introduce an awn of barley, with the seed uppermost, between his coat and shirt-sleeve at the wrist, when he walks out in the morning, and by the time when he returns to breakfast, if he has walked any considerable distance, he will find it up at his shoulder. This journey has been effected by means of the continued motion of the arm, and consequently of the teeth of the awn, acting as feet to carry it forward."

Where seed are to be dispersed to a great distance, nature makes use of the agency of winds, streams, ocean currents, and living animals. The agency of winds is one of the most effective of these modes of dispersion, and in the case of many seeds, we may notice in their structure, peculiarities fitting them for being scattered in this way. The seeds of mosses, lichens, and fungi, are so exceedingly minute, that they float with ease in the air, and vegetate wherever they meet with a suitable soil. The seed of the white poplar (*liriodendron tulipifera*) are furnished with a wing, so that when falling from the tree, they are caught by the wind, and carried to some distance. The seed of the maple (*acer*) and elm (*ulma*) are fitted for this mode of dispersion, by the structure of their capsules, which are furnished with membranaceous wings, and of course are affected by the wind, in the same way with the seeds of the white poplar. The seeds of the dandelion (*leontodon taraxacum*) and thistle (*cnicus lanceolatus*) are terminated by a slender stalk, supporting a tuft of fine hairs at its extremity. This tuft of hairs is eminently hygrometrical, spreading out in dry weather, and collapsing again when the atmosphere is damp. In consequence of this spreading of the hairs, so soon as the seed are ripe, they are broken off from the stem, and thus the more easily taken up and borne along by the wind; but so soon as a drop of rain strikes one of them, the tuft of hairs immediately collapses, the seed falls to the ground, and is imbedded in the soil, in circumstances the most favorable to its future growth. The seed of the curly-head (*clematis viorna*) are furnished with a long plumose tail, which serves to scatter them in just the way in which the tuft of hairs does those of the thistle.

The instrumentality of streams, rivers, and ocean currents, and a further means, are made use of by nature, for the dispersion of seed. The mountain stream washes down to the valley the seed which may accidentally fall into it, or which it sweeps from its banks during a freshet. The river, winding along through extensive portions of country, conveys to the distance of many hundreds of miles the seeds of plants which have grown at first only at its source. On the islands in James river at Richmond, there is no more common plant than the *tradescantia*, a plant which properly belongs to the mountainous regions in which that river takes its rise. That the seed from which these plants have sprung, must have been floated down by the river, is evident from the fact, that in eastern Virginia they are found no where except on the islands in this river, and along its banks; whilst they grow in great profusion and luxuriance in the part of the country in which the river takes its rise. "The southern shores of the Baltic, are visited by seed which have grown in the interior of Germany, and the western shores of the Atlantic by seed from the interior of America. Fruits indigenous to America and the West Indies have been found on the western shore of Europe, and even on the coast of Orkney and Shetland, evidently carried thither by the ocean currents."

Another very common means made use of for the disperson of seed, is the instrumentality of animals. Many seeds are carried to a distance from the place where they grew, by attaching themselves to the bodies of animals, who have accidentally come in contact with them, whilst in search of food; the hooks or hairs with which either the seed, or the pericarp is furnished, serving as instruments of attachment, the seed thus fastened upon the animal, being carried about with it until it is detached by some means, and committed to the earth. This is exemplified in the beggar's-tick (*bidens*) where the hooks are attached to the seed itself; in the bed-straw (*galium*,) where they are attached to the pericarp; and in the burdock (*arctium*,) where they are attached to the general calyx. Many seed are dispersed by animals in consequence of their pericarps being used as food. This is often the case with cherries, and the berries of various plants, which birds often carry away, until they meet with some convenient place for devouring the pericarp, and then drop the seed into the soil. So also seed are dispersed by such animals as the squirrel, who hoard them up for their winter's food. Sometimes the seed are hoarded up in the earth itself, in which case some of them will generally be found to take root and spring up into plants; though it has been noticed that ground-squirrels often deprive the seed of its germ before depositing it in their holes, as if apprized of its liability to grow in such a situation as that in which they place it. The Indians assert that all the oaks of this country have been planted by squirrels. The seed is frequently taken into the stomach of the animal, and afterwards deposited in the soil unhurt. This is the case with the seed of the mistletoe, (*viscum*,) which the thrush swallows, and afterwards leaves upon the boughs of such trees as it may happen to alight upon. The same is the case with the seed of the poke-berry (*phytolacca decandra*,) which are eaten in great numbers by black-birds and robins. It seems indeed surprising, that any seed should be able to resist the heat and digestive action of the stomachs of animals, and yet it is an undoubted fact that they do. Some seed seem even to require it. It is stated by an English botanist, that the seeds of *magnolia glanea*, which have been carried to that country, have generally refused to vegetate until after undergoing this process. It is known that some seeds will bear a great degree of heat without injury. "Spalanzani mentions some seed that germinated after having been boiled in water; and Du Hamel gives an account of some others that germinated after having been exposed to a temperature of 235° Fahrenheit." It is stated by Mr. Cleghorn that "a farmer in the west of Scotland has been in the practice, for some years, of feeding his cows upon potato-balls, and using their dung; raising seedling plants from it, the seed having passed through the stomachs of the cows, without having undergone such a change as to prevent their vegetating."

That all the more perfect plants are propagated by means of their seed, is a fact so abundantly proven by experiment and observation, that it can no longer be called in question; but that the same is true of the more imperfect plants, such as ferns, mosses, lichens, fungi and sea-weeds, is not equally certain. As such plants produce no regular flowers, and possess none of those organs of fructification by whose instrumentality the seeds of more perfect plants are produced, we would naturally expect, that if they produced seeds at all, they would be of a nature entirely different from those to which we have already attended. That nature has not neglected the means of reproducing these plants, however, is plain, from their great abundance in favorable situations. On examination we find that although they do not produce regular seed like the more perfect plants, they nevertheless, produce that which answers the purpose equally well. The bodies by means of which they are reproduced, are termed *spores* or *sporules*. In the case of the more perfect flowerless plants, that these *spores* act precisely like seed in reproducing the species, there can be no doubt; for if those from the back of the leaves of a fern, or from the urn of a moss be sown, as has often been done, they uniformly produce the same species as that from which they were derived. Spores differ from regular seeds, both in their structure, and in their mode of growth. Instead of possessing a regular germ, divided into *plumule* and *radicle*, to which one or more cotyledons are attached, they are mere homogeneous masses of cellular substance; and indeed, sometimes consist of a single cellule. When they begin to grow, instead of growing from one fixed point of their surface upwards, and from another downwards, they are capable of sprouting from any part of their surface indifferently; that portion of the suface which is exposed to the light, extending into a stem, and that which is turned from the light, becoming a root. "Mirbel, in his experiments on *marchantia*, ascertained that it was possible, up to a particular period of the growth of the spores of that plant, to induce the parts which they had developed to change their functions; the rudimentary stem taking on itself the office of a root, and the new-born root becoming a stem, when their situation was inverted."

With respect to the more simple forms of vegetation, such as fungi, lichens, and sea-weeds, this matter is involved in greater mystery; some botanists believing them to be produced by a sort of equivocal generation. In their opinion, there is a common vegetable matter, consisting of simple globular cellules, each of which is possessed of the vital principle, and capable of growing into a new plant. But whilst they allow to these cellules the power of growing into new plants, they contend that the particular species of plant into which any one of them shall grow, is determined, not by any thing in the cellule itself, but by the particular circumstances in which they are developed; "that such cellules, if called into life upon a bare wall, become lichens; in a dark cellar, fungi; in the skin of a plant, parasites, and in water, *confervæ*" or sea-weeds.

In favor of this opinion such arguments as the following are adduced. That a conferva is never found in any other medium than water, and a lichen only in air. Many forms of matter, it is said, uniformly produce the same species of plant; for example, decayed cheese, which has always the same blue mould, or fungus. The parasites which grow upon the rose, and many other plants, are always confined to particular species, and sometimes to particular organs, those of the bark not being always the same as those of the leaves. If one of these plants is examined microscopically, it will generally be found a mere mass of cellules, exactly like the spores or reproductive cellules. It is further asserted, that the power of reproduction is not confined to the spores, but exists in all the cells of which these plants are composed. "If we add to these considerations, the singular fact, that man holds, as it were, in his hands, the power of creating these things at will—at least in the case of the common mushroom, which will always be produced by a mixture of decayed and earthy matter—it cannot be denied that a strong *prima facie* case is made out by those who doubt the specific power of reproduction in the spores of the lower tribes of plants.'[1]

In answer to these arguments it is urged, by those who hold a different opinion, that it is by no means certain that all these statements are true as matters of facts. The imperfection of our means of observation may lead us to confound forms of matter which are essentially different; and also, to separate forms of matter which are essentially the same. It has lately been shown, that many of the so-called parasites are nothing more than morbid conditions of the cuticle of plants; and moreover that the separation of the different orders of these plants into species, is in very many cases, erroneous. As to the assertion that the power of reproduction is possessed by other parts of the plant besides the spores, it is plain that no certain information can be obtained respecting this matter, unless some way of effecting a perfect separation of the spores from the part experimented on, can first be devised, and no one pretends to have discovered such a way as yet. On this subject, Prof. Lindley remarks "surely it is more philosophical, more conformable to what we know, to ascribe these phenomena to myriads of microscopic spores, floating in the atmosphere, and dispersed by currents of air wherever that air can penetrate; and those who are practically acquainted with the nature of spores will be the least likely to question the probability of this; for they best know how inconceivably minute, and how infinitely numerous these spores are. Even the most common observer may form some notion of the fact, from the calculation that millions must be contained in a single puff-ball; and that many hundreds of these reproductive organs, are emitted by every microscopic head of the common blue mould of cheese. Let us not then be led astray, by specious theories and imaginary facts concerning bodies so far beyond the cognizance of our senses; but in the absence of demonstrative evidence to the contrary, let us believe that the great author of nature is consistent with himself in all his works, and has taken care to enable the most humble fungus to be multiplied by means as certain and unchangeable, as is provided for the stateliest oak of the forest. We may rest assured, for all philosophy, and all observation, and all reason prove it, that there is no such thing in nature as blind chance; but that all things have been carefully and wisely designed, with reference to the particular circumstances in which they exist."

CHAP. XIV.

GERMINATION. CHEMICAL CHANGES WHICH TAKE PLACE. CIRCUMSTANCES FAVORABLE TO GERMINATION. CIRCUMSTANCES FAVORABLE TO THE PRESERVATION OF SEED. MATURATION OF FRUIT.

Germination is the process by which a new plant originates from the seed. The phenomena which are presented during germination may be divided into physical and chemical. The physical phenomena have been already adverted to. The most important of them are, the production and developement of the young radicle downward, and the extrication of the plumule and its developement in the air. The chemical phenomena we will now examine more particularly, for the purpose of ascertaining what circumstances are favorable, and what unfavorable to germination. The change which is produced in barley (*hordeum*) by the process of malting, is nothing more nor less than the germination of the barley. From an analysis of malted and unmalted barley made by Proust, their composition is as follows:

One hundred parts	of barley	of malt
Contain of resin	1	1
" gum	4	15
" sugar	5	15
" gluten	3	1
" starch	32	56
" hordein { a proximate principle peculiar to barley, }	55	12

From an inspection of the results of this analysis, it will be seen that the principal chemical change which takes place, during the germination of the seed, consists in the conversion of hordein into starch, gum, and sugar, so that from an insoluble material, (for hordein is insoluble in water,) which could not in that state be applied to the use of the young plant, two soluble and highly nutricious principles result, which, by being soluble in water, are easily made use of by the plant. The production of sugar in this case, identifies the change which the seed has undergone, with what is termed the saccharine fermentation. The circumstances which are favorable to the production of the saccharine fermentation in vegetable matter, are well known; they are, a temperature from 60° to 70° Fahr., the presence of moisture, and the free access of atmospheric air. Let us see how far observation will justify us, in applying the remark to the germination of seed.

1st, With respect to the temperature best adapted to the germination of seed. No seed has ever been known to germinate at or below the freezing point; hence seed do not germinate in winter, even though lodged in their proper soil. The temperature most favorable to germination, varies widely in different species; seeds being known to germinate at almost every temperature between the freezing and boiling points of water. Nearly all plants indigenous to temperate climates, require a temperature of at least 50° Fahr. for germination; the precise temperature in each varying with the peculiar constitution of the species; a circumstance which explains the regular succession noticeable in the leafing of different trees, and in the appearance of annual herbaceous plants, during the spring and summer. We are not, however, to infer from this that the particular temperature at which the seed of any plant usually germinates, is the most favorable which is possible for its germination. Adanson found that seed which will germinate at ordinary temperatures in the space of twelve hours, may be made to germinate in three hours, by exposing them to a greater degree of heat.

2nd, The presence of moisture. Seed will not germinate if they are kept perfectly dry. Water, or some similar liquid, is essential to germination; hence seed sown during a drought will never grow until the rain has moistened the ground in which they are deposited. But the quantity of water present is not a matter of indifference; for it is found that if there be two much water present the seed will rot. The quantity of water required by different seeds is not the same. Some can bear but little water, whilst others will germinate when partially immersed, as has been proved by an experiment of Du Hamel, at least in the case of peas. When he placed peas so that they should be about half immersed in water, he found that they germinated as freely as if placed in the soil; but much more than this they could not bear, for when totally immersed they rotted. There are some seed however, which will germinate when totally immersed, as must necessarily be the case in the seeds of aquatic plants.

3rd, The access of atmospheric air. Seed will not germinate if placed *in vacuo*. Ray introduced some seed of lettuce into the receiver of an air-pump, and having exhausted the air, he let them remain for some time, but no germination ensued; he then readmitted the air, and the seed germinated after the usual period had elapsed. It has also been ascertained by experiment, that seed will not germinate either in nitrogen, carbonic acid, or in hydrogen gas; and hence we conclude that it is the oxygen of the atmosphere which is essential to germination.

The influence of light, which is so favorable to growth in all the subsequent stages of vegetation, is injurious to the germination of the seed. Sennebier has proved that a seed germinates more rapidly in the shade, than in light, and in diffused daylight, than when exposed to the direct rays of the sun. The reason of this is, that light effects the fixation of carbon in the tissues, a hardening process, exactly the reverse of that which takes place in germination. Soil is by no means essential to the germination of seed; the requisite nourishment for the young plant during the first stages of its growth being deposited in the seed itself at the time of its formation. The embryo requires only the joint influence of air, moisture, and a proper temperature, to enable it to grow, and appropriate this nourishment to its own use. Yet soil, in consequence of its mechanical texture, permitting, as it does, the free access of air, and excluding the light, is very favorable to germination. Besides these circumstances, it is generally necessary that the seed should have reached full maturity in order to germinate well. This however is not always the case. The seed of the sacred bean of India (*cyamus nelumbo*) will sometimes germinate whilst it is yet in the capsule and connected with the parent plant. The same is true of the seed of the mangrove, a tree which grows along the borders of the sea in tropical countries. Whilst the seed of this plant is yet in the pericarp, its young radicle pierces the seed vessel, and elongates until it reaches the soft mud in which such trees grow, where it takes root, and afterwards separates from the parent plant. These instances however must be considered as exceptions to a general rule.

The period necessary to complete the process of germination, is not the same in all plants, even where all the conditions necessary to germination are fulfilled. Some species require a shorter, and others a longer period. The grasses are among the number of those plants whose seeds germinate most rapidly, and rosaceous plants among those which germinate most slowly. The following table indicates the period of germination of a considerable variety of seed, as determined by Adanson.

Wheat - -	1 day	Cabbage -	10 days
Beans, mustard	3 "	Hyssop -	30 "
Lettuce - -	4 "	Parsley -	40-50 "
Melon, cucumber - - -	5 "	Peach -	1 year
Radish, beet	6 "	Rose - -	2 years
Barley - -	4-7 "		

When seeds are protected from the action of those agents which facilitate germination, they may generally be preserved for a long time; but even in the most favorable circumstances, they at length lose the power of germinating. The period during which seeds preserve their vitality, varies much in different species, and also in the same species, in different circumstances. An exposure of a few weeks is sufficient to destroy the vitality of many seeds; especially those which are covered with a thin and delicate skin. On the other hand, all hard bony seeds, such as those of the pea tribe, may be kept for many years, without material detriment to their germinating power. Seeds of the sensitive plant (*cassia nictitans*) have been made to grow after an interval of 26 years; and peas, taken from a collection of seed made by

Tournefort, where they had remained for more than 100 years, germinated quite freely.

The circumstances which seem most favorable to the preservation of seed, are; 1st, uniform temperature; 2nd, moderate dryness; and 3rd, exclusion of light; and the success with which seeds are preserved for any length of time will be found to depend very much, upon the attention which is paid to these three things. Seeds brought from India to England around the Cape of Good Hope, rarely vegetate well; in this case, their double exposure to the heat of the equator, and their subsequent arrival in a cold climate, are probably the cause of their death; for seeds brought over land from India, and therefore not exposed to such fluctuations of temperature, generally succeed well. Others again, which cannot be conveyed alive if exposed to the air, will travel in safety for many months, if buried in masses of clay, and rammed tight in boxes. Seeds buried deep in the soil, being removed from the influence of air and light, and subjected to the uniform temperature of the earth, often preserve their vitality for many years. Hence it comes, that when a waste field is cultivated, plants often spring up, which have not been known to grow in that situation, within the memory of man; and species, for many years lost to florists, occasionally spring up on the sites of old botanic gardens.

Immediately after the fertilization of the young seed, the ovary or pericarp undergoes a change. In some cases, it at first enlarges, then becomes cartilaginous and dry, and gradually changes from green to brown, or white, forming what is commonly called the pod or seed vessel. In other instances it increases in volume, becomes succulent, instead of drying up, often acquires the gayest colors, and becomes what we commonly term the fruit, that is, "a body which may be eaten, or which looks as if it might." The term fruit has a more extensive signification in botanical than in common language. It is applied to the full-grown ovary, whatever may be its size, form or texture, and whether it be edible or not. So long as the fruit retains its green color, it seems to act in a manner precisely similar to that of the leaf; and hence, those fruits which become fleshy or juicy, may be supposed to become so, in the same manner as the leaves of the prickly pear (*cactus opuntia*) do; *i. e.* from the accumulation of sap in their tissues. The various colors the surface of fruits assume during their growth, are probably owing to certain changes of the chromule, analogous to those which take place in leaves, just before their fall.

The process of maturation, or ripening, consists in certain chemical changes, to which the accumulated juices are subject, under the action of air, light, and a proper temperature. That it is not owing to the acquisition of new materials from the stem, is evident from the well known fact, that nearly all full-grown fruits are capable of ripening when separated from the stem. "This was also demonstrated in the most striking manner, by M. Tshudy, who succeeded in grafting young melons upon gourds, and the fruit of the tomato upon the stem of a potato; the fruits grew and ripened, preserving their own peculiar flavor, unaffected by the stock." When ripening commences, the acid of the fruit usually increases in quantity; and in some instances, as in the current, the cherry, &c., continues to increase until the fruit is matured. In other edible fruits, the acid after a time diminishes, and the quantity of sugar rapidly increases, as will be evident from inspecting the following table.

Apricots,	when green contain	6.64	of sugar ;	when ripe	16.48
Duke cherries	"	1.12	"	"	19.12
Green gage plums	"	17.71	"	"	24.81
Melting peaches	"	.63	"	"	11.61
Jargonelle pears	"	6.43	"	"	11.52

This sugar is probably produced by the action of the vegetable acids, upon the gummy, mucilaginous, and gelatinous matter contained in the fruit. "M. Couverchel has found, that if we treat apple jelly with a vegetable acid dissolved in water, we obtain a sugar, analogous to that of the grape; that the gum of peas, if treated with oxalic acid, and exposed to a high temperature, changes to sugar; and that tartaric acid, if mixed with the juice of green grapes, renders the latter saccharine." The change which fruits undergo during the process of cooking, and which renders them sweet, is probably produced in the same way. The alterations which fruits undergo after ripening, in most cases decaying, in others blighting, seem to depend principally upon the presence of oxygen gas. Bérard succeeded in preserving for several months, with little alteration, the fleshy fruits of several plants, by placing them in hydrogen or nitrogen gases.

(*To be continued.*)

OF LIME.

From the Edinburgh Encyclopædia.

Lime has been regarded by some as a manure, by others as a stimulus, which can only be profitably applied where the soil possesses some dormant principle of fertility that needs to be roused into action. In fact, the *modus operandi* of lime is imperfectly understood, though the greater part of agriculturists seem pretty well acquainted with its effects. It is sufficiently understood, that land which has been long in grass, contains much vegetable matter, and that the trouble and expense of liming it will be amply repaid to the cultivator; but the propriety of applying lime on old arable lands has been questioned, and with much justice, by the most part of practical agriculturists, and their doubts on that head are confirmed by the fullest experience. If lime were a manure, then it would be a noble substance for enriching and restoring fertility to lands that were worn out by a succession of corn crops; but as worn out land is not restored to fertility by the application of lime, we are warranted to rank it in a different class, or, to speak more correctly, as an article calculated to bring certain principles into action, which were previously possessed by the soil. This conclusion is sanctioned by experience; and experience is a far better guide than the most plausible theory.

Lime has been used with very great success in every part of Great Britain, though it is evident that the grossest errors have been committed in the after management of land to which lime has been applied; and, what is worse, that the extent of these errors was in direct proportion to the effect produced upon the soil by the application. This remark applies more to the former state of husbandry than to the present practice, because the former rule was to crop so long as the earth would make a good return, without considering that a field, so treated, was not to be recovered for a century afterwards. Indeed, when lime duly operates, the whole powers of the soil are put in a state of requisition, and may be forced to act till the very soul of vegetation is extracted. It is scarcely practicable to restore fertility to land, even of the best natural quality, which has been thus abused; at least a considerable period must elapse before it can be restored to its original fertility; but thin moorish soils, after being exhausted by lime, are not to be restored. To lime them a second time, is not only a useless expenditure of labor and money, but also productive of serious mischief. Soils of this description, after a second liming, are apt to singe and burn the grain that is sown upon them, and even when dunged, not to make such a return as would have been rendered under different circumstances.

It is a difficult matter to say at what period the use of lime was first introduced into Britain; but as it was well known to the Romans, there is good reason to believe, that by this ingenious people, the use of it was first brought into practice in this island. Be that as it may, this mineral after undergoing the process of calcination, has long been applied by British husbandmen as a stimulus to the soil, and, in consequence of such an application, luxuriant crops have been produced, even upon soils apparently of inferior quality, and which would have yielded crops of trifling value, had this auxiliary been withheld. In fact, the majority of soils cannot be cultivated with advantage till they are dressed with lime; and whether this beneficial effect shall be considered as an alterative, or as a stimulant, or as a manure, it will be found to be the basis of good husbandry, and of more use than all other manures put together. Wherever lime has been properly applied, it has constanly been found to prove as much superior to dung, as dung is to the rakings of roads, or the produce of a peat mire.

From a pretty long experience, and considerable attention to the operation of lime, we are inclined to think that it acts both as an alterative and a stimulant, operating in the one case as a medicine, that changes the nature of the soil, and in the other, as rousing, or bringing into action, the vegetable powers contained in the soil, which without such an application, would have remained dormant and inactive. These opinions, we know are different from what have been maintained by several ingenious men on the subject; but they are supported by the result of numerous trials, undertaken to ascertain how, and in what manner, lime operated upon the soil, and whether it could be used in a hot or *effete* state with the most advantage. On these points, theoretical writers are apt to fall into mistakes; and therefore every theory not formed from facts, must be viewed as a romance which may amuse, but cannot instruct agriculturists.

The writer of this article, for a period of thirty years, has been in the regular habit of applying considerable quantities of lime; indeed few of his profession have used more of this useful article. In the majority of cases, the application has been highly beneficial to his interest, changing in a manner the very nature of the soil, and causing it to produce the most abundant crops; whereas in others, the article has been altogether useless, and in some instances the application has been followed by mischief instead of benefit. As most of these trials were executed upon a large scale, and upon soils of almost every different quality, more benefit may be gathered from a succinct account of them than from a long chain of argument. The trials are fairly stated, and the results may perhaps throw some light upon this abstruse subject

It is proper to premise, that a good deal of uncertainty prevails with agriculturists, respecting the application of this article; and that much dispute has taken place among those who have applied it only to one kind of soil, or who have not used it under different circumstances. Some have contended, that lime ought to be applied only when it is in a hot powdered state; and that when it becomes *effete*, the effects are comparatively trifling and unavailing. Others maintain, that grass land is the best bed for the reception of lime, while many of our most enlightened farmers strenuously affirm, that it is most judiciously used when the land gets a complete, summer-fallow. It would not be difficult to prove, that each class of disputants, in the view they take of the subject are equally in the right; and that they only condemn the system of others, because their own has turned out to be successful. Our opinion is, that, in every case where the land is constitutionally disposed to receive benefit from a calcareous dressing, *that is*, when it is refreshed by grass, or enriched by dung, it is of little importace, in respect of operation, whether lime is applied *hot* or *effete;* upon grass land, or upon fallow; and that convenience ought chiefly to be studied, when the most proper time for applying the article is to be ascertained. In point of economy, there can be no doubt, but that lime is most economically used, when laid upon land hot from the kiln; this mode also lessens the expense of labor considerably; consequently the practice of using it when *effete* is more expensive. It is obvious, however, that a choice of season is not always in the farmer's power; and that imposing necessity often obliges him to lay on lime when completely *effete*. Repeated trials, however, have convinced us, that its operations are equally beneficial in the one state as in the other; though the expense in the last case, as already said, is greater than in the former. With regard to the other branch of dispute, whether land in grass, or land in fallow, is the most proper bed for the reception of lime, we are of opinion, that the difference is immaterial. If grass land is clean, and if lime can be got forward at the time, the application will be as efficacious upon it, as upon the richest and best wrought summer-fallow.

That these things are not matter of opinion, we mean to show, by detailing the results of the trials made to ascertain the facts. To render these details more perfect, we shall mention the nature of the surface and subsoil upon which the several trials were made, and explain the state of the ground at the time; and, when necessary, the management practised for a series of years afterwards.

Field, No. 1. was soil chiefly composed of thin clay, some of it approaching to a moorish quality, *i. e.* mixed with peat earth; the whole incumbent upon a subsoil retentive of moisture.

This field had been in grass for several years, but yielded very poor returns. It was fallowed without taking any corn crop; and the lime which was brought forward during the summer months, was applied in the following spring, previous to the seed-furrow being given. At that time, it was completely *effete*, and would hardly go from the shovels. About 45 Linlithgow barley bolls, or 280 Winchester bushels, as originally laid down, were applied to each Scottish statute acre.

First year—The crop was oats, but little benefit was discovered from the lime.

Second year—The ground began to ferment, which showed, that the lime was in action. The husbandry of flax being then in vogue, it was tried upon this field; and the crop was excellent, both in respect of flax and seed.

Third year—It was sown with gray pease after two furrows, which returned a great bulk of straw, but not much grain. The clay part of the field was now quite loose and free, while the moorish soil seemed more compact and firm.

Fourth year—Red wheat was sown, which turned out a bulky crop, though the season was adverse. The straw was hard, bright, reedy, and of great length. Perhaps the greatest quantity of dung applied at once, would not have produced such a crop.

Fifth year—The field was summer fallowed, but no dung was applied.

Here it may, with justice, be urged, that a great error was committed in withholding dung at this stage; and it is acknowledged, that a dose of manure, had circumstances permitted, could not have been more beneficially bestowed. In vindication of the management practised, we may only state that at the period in question, dung was a very scarce article upon the farm; and that many fields would not crop at all, if it was withheld. The one under consideration, appeared quite capable of carrying several more crops, without assistance; consequently viewing the economy of the farm as a whole, it was thought preferable to act in the manner described. Many things are eligible in general management, which cannot be individually executed; and, as in public affairs, a partial evil must often be committed to promote the general good.

Sixth year—The field was sown with oats, and produced a heavy crop both of straw and corn. Grass seeds were sown with the oats.

Seventh year—The field was despastured with cattle. The grass was but indifferent, which is a common circumstance upon new limed land; at least where a heavy dose is given. This induced us to plough it again, in the succeeding spring.

Eighth year—Oats were sown, which yielded a decent crop.

Ninth year—The field was thoroughly summer-fallowed and dunged, at the rate of sixteen double loads to the Scottish acre. Wheat was sown.

Tenth year—The crop of wheat was excellent, being not only bulky, but of fine quality.

Eleventh year—Oats and grass seeds were sown, and the ground surrendered to pasture. Since that time, it has been a few years under corn; and though the produce of these crops cannot, by any exertion, be made to equal those which are enumerated; yet the soil is evidently much improved in every respect, when compared with its original state, previous to the lime being applied.

Field, No. 2. was a real moorish soil, incumbent upon a close bottom, which had been over-cropped after lime, by a former tenant.

We began with a summer-fallow, and applied a part of the same kind of lime which answered so well upon field No. 1. The lime, was laid on during a hard black frost, at the rate of 35 bolls, or 210 bushels per acre, and was then *effete*. Oats were sown; but the crop was a poor one, and the after attempts were not more successful. The stalk of the plant generally *singed* and decayed, after the strength of the seed pickle was gone; which is a sure proof of ground being worn out with lime. This will always happen, though in different degrees, upon all such land, unless a considerable quantity of dung is bestowed; which unfortunately, in this instance, was not the case.

Field, No. 3.—The soil was of a moorish quality, but superior to that of No. 2.

We fallowed the field out of grass, and applied lime hot from the kiln; but the consequences were much the same as mentioned in the preceding instance. The oat-crop looked brisk at first, but decayed daily, as the strength of the pickle was exhausted. Tried dung with a second fallow, when the lime appeared to operate in a trifling degree, but not to that extent as to repay the expense incurred.

Field, No. 4.—The soil was partly thin clay, the remainder of a soft sandy nature, but all upon a wet bottom.

This field had lain, for a great many years, in grass, and displayed no signs of having been previously limed. We applied the lime upon the grass surface, when it was *effete*, and ploughed for oats: the crop good. The lime did not come into full action till the third year, when pease were sown; and, for a number of years afterwards, the different crops taken were not inferior to those of the best in the field.

Field, No. 5.—The soil was chiefly a soft loam upon a wet bottom; which at any rate, had not been limed since the ridges were levelled and straightened.

We summer-fallowed this field, after a crop of wheat, and dunged it substantially, as it appeared to be in an exhausted state. We applied lime hot from the kiln, at the rate of 40 bolls, or 240 bushels per acre, which operated immediately. It is now sixteen years since the application; during which time, the field has been only three years in grass, and yet its effects have not ceased.

Field, No. 6—The soil was a strong loam incumbent upon clay, which had carried five crops of grain after being ploughed from old grass.

We summer-fallowed and dunged this field; applied lime also, which was laid on hot from the kiln, in the month of August, after six ploughings were given. The quantity applied was forty barley bolls per acre; which, in less than a month, occasioned a fermentation of the soil, something similar to what is produced by yeast upon unbaked bread. In another respect, the improvement made upon this field by lime was conspicuous. Barley could, with difficulty, be raised before lime was used; whereas, afterwards, fine crops of this grain were procured with facility. The ground was likewise much easier ploughed and harrowed than formerly, which is always a sure token of an improvement being accomplished.

Field, No. 7.—The soil was generally a thin sharp loam, a great part of it incumbent upon a close bottom. It had been three years in grass, and was sown down in good order; and, therefore, was a proper subject for receiving lime upon the sward. There was reason to believe that lime had been applied by a former tenant, but this was not certain. After harvest, we laid on from thirty-five to forty bolls per acre, not thinking the soil required a heavy dose. It was partly hot, and partly *effete*, as generally happens at that season of the year.

First year, oats were taken; the crop good. Second year, drilled beans, with intervals of twenty-seven inches; the ground being twice ploughed before sowing, and four times horse-hoed; crop middling. Third year, wheat after one ploughing, which yielded a full average crop. Fourth year, it was under summer-fallow; to which 12 double loads of dung per acre were given. Fifth year, in wheat; crop excellent. Sixth year, in drilled beans, which were managed as above. Seventh year, wheat; crop above mediocrity. Eighth year, barley, with grass seeds, after three ploughings; which, though the season was adverse (1799), turned out a decent crop. Ninth year, under grass, which was pastured with cattle, and not inferior to any in the country.

It may be objected, that the above is hard cropping. This may be the case; but we are far from acknowledging that hard cropping, in certain cases, is inconsistent with good farming. The expense of lime in general is so great, that a necessity for hard cropping may be said to be thereby created. Besides, this necessity is increased by the general shortness of leases, which impedes every permanent improvement; and, in the usage of lime, calls for the utmost exertion of the tenant, that he may be reimbursed his extrordinary outlay and trouble.

Field, No. 8.—The soil was chiefly loam, though of different varieties, and mostly incumbent upon a close bottom.

This field, which consisted of fifty acres, had been cropped for time immemorial; and, when we entered to the farm, was so tired with carrying wheat, that is was scarcely worth the ploughing. It was therefore laid down to grass with all convenient speed. In this state it remained five years, when it was broken up again; thirty acres having been limed upon the sward, at the rate of forty barley bolls per acre. Some of the lime was laid on three years before ploughing, some of it two years, and the remainder a few days before the ploughs entered. Part of it was hot, part of it *effete;* but the effects over the whole field, even in the first year, were nearly the same; if there was any difference, the ridges last limed fermented most, but the crop was equally bulky wherever the lime had been applied; though, upon the twenty acres unlimed, the inferiority was evident. From this it appears, that it was not necessary to apply lime to grass land one or two years before it was broken up, as inculcated by several writers upon husbandry; a practice, at any rate, not reconcileable with economy, as much of the lime is washed off the surface, and carried away by rain before the ground is ploughed.

Field, No. 9.—The soil was chiefly thin clay, incumbent upon a bottom of till; consequently, subject to receive injury from wetness. This field had been severely scourged by the preceding tenant; had been injudiciously straightened, which is a fatal measure to such soils; had been limed previous to the straightening; but, at our entry, was wholly under crop, and in an exhausted state. After being summer-fallowed, in as perfect a way as circumstances permitted, this field was laid down in grass, and depastured with cattle for several years. Lime (the greatest part of which was in an *effete state*) was applied upon the sward during the winter months; and, in February following, the field was ploughed for oats. The crop was middling good; but, in the six subsequent years, it did not appear that much benefit was gained from the application. In the eighth year, however, the lime acted vigorously; a small part of the field which remained unlimed being at least 50 *per cent.* inferior in crop, though the management, in every other respect, had been similar.

It is difficult to account for this cessation of action during so long a period, though it is believed that instances of the like nature are not unfrequent upon secondary soils. Whether a deeper ploughing had been given in the preceding season which might bring the lime to the surface; or whether the original poverty of the soil precluded the lime from operating, till it was assisted by a copious application of dung, are circumstances not easily ascertained. In our opinion, the lime was brought into action by the dung bestowed; though it would be rash to state, as a matter of fact, what, at best, is only a probable conjecture.

Field, No. 10.—The soil was of various qualities. Part of it a thin loam, part of a sandy nature, and the remainder approaching to a thin clay; but all upon a bottom retentive of moisture. After pasturing the field for one year, we applied lime upon the sward, at the rate of 40 Linlithgow barley bolls, or 240 bushels per Scots acre. The lime was partly hot; but the greatest part of it was *effete*, which must necessarily be the case when lime is *hutted*, unless the huts are completely covered. No difference, however, was discovered in the operation, from the state in which the article was applied.

First year—The crop was oats. The season being excessively dry, little benefit was got from the lime.

Second year—We fallowed the field completely, and dressed it with dung, at the rate of fourteen double loads per Scots acre.

Third year—We sowed barley and grass seeds. The crop of barley was very good.

Fourth year—The field was despastured with cattle.

Fifth year—It was ploughed for oats. Crop excellent.

Sixth year—We drilled the field with pease and beans, after two ploughings, which were managed as already described; the crop was of great bulk, and produced fully nine bolls per acre.

Seventh year—Wheat was sown, and the crop was excellent.

Field, No. 11.—The soil was of an inferior kind of loam, upon a close bottom. The year when this field was last under summer-fallow, we applied lime to a part of it, by way of trial. Dung was given likewise. We sowed barley and grass seeds. We took a crop of hay, and ploughed for oats. Every one of these crops was strikingly superior, where lime had been given; indeed, the superiority was recognizable at a considerable distance.

Field, No. 12.—The soil was chiefly a heavy deep loam; some of it a strong, tenacious red clay, but almost wholly incumbent upon a close bottom.

We ploughed this field from old grass, and sowed it with oats. It was summer-fallowed in the second year, and dressed with lime, which was mostly applied hot from the kiln; being drawn from the cart in regular sized heaps of five pecks each, or thereby, and spread the moment it was slaked by rain, or atmospherical moisture. About two-thirds of the field received 50 barley bolls, or 300 bushels per acre; the remainder from 60 to 70 bolls per acre; and the operation appeared to be in direct proportion to the quantity applied; nor was there any distinction discernible, betwixt what was applied hot, and what was completely *effete;* some of it, indeed, the season being remarkably wet, was nearly in a mortar state: the whole answered well, and operated immediately.

It was noticed, in this field, that a few ridges, on which the lime was spread in a windy day, carried crops rather inferior to those of the contiguous ones: we apprehend that the most valuable particles of the lime had been carried off; and would recommend, that spreading should be discontinued, when a high wind arises.

Much difference of opinion having prevailed, relative to the quality of the several limestone quarries in the neighborhood, a trial was made of lime from each of them, upon six adjoining ridges of the above field. Though a difference to the eye was visible in almost every one of these samples, yet the effect upon the ground was, from all of them, precisely similar; nor could the most accurate judge say which was the greatest. The quantity applied in each case was the same; and the operations of laying on the lime, spreading it, and ploughing the ground, were all carried on in an uniform manner.

Field, No. 13.—Consisted of loam of different varieties, upon a bottom inclined to wetness, and the ridges lying in a broad and serpentine state.

We ploughed for oats, and then took drilled beans, which were succeeded by wheat. The first and last crops suffered much from the grub. We fallowed the field in the fourth year, cleaving in different breadths, and cross ploughing the ridges, alternately, till the surface was completely levelled; then formed the ground into eighteen feet ridges, applied twelve double cart loads of dung, about one ton each, and fifty barley bolls of lime, to the Scots acre. The lime was laid on hot from the kiln, and spread as fast as it was pulverized. This quantity was found rather too much for the softest part of the field, which, after all, is a circumstance that rarely happens; but on the remainder the fermentation was not greater than necessary; and from this part of the field, the best crops have been procured, though the ridges were both higher and broader, and required more levellings than the other.

We may now draw a few plain and practical inferences from what is stated.

1st, That lime operates equally well, whether applied in a *hot* or *effete* state, provided the condition of the ground upon which it is used, be such as to render a calcareous application beneficial.

2dly, That, in respect of operation, it is immaterial whether the lime be used upon grass land or summer-fallow, and that objects of conveniency ought chiefly to weigh with the farmer in ascertaining the most proper time for applying this article. Upon old grass land, it is perhaps best to plough first, and to summer-fallow in the second year, when lime can be applied. On new and clean grass land, hesitation is superfluous; it may be limed at the outset, that is, before the plough is admitted.

3dly, That to lime moorish soils is a hazardous business, unless dung is likewise bestowed; but to repeat the application upon such soils, especially if they have been severely cropped, is almost a certain loss, and that a compost of lime and rich earth is, in such cases, the only substitute.

4thly, That strong loams and clays require a full dose to bring them into action; such soils being capable of absorbing a great quantity of calcareous matter. Lighter soils, however, require less lime to stimulate them, and may be injured by administering a quantity that would prove moderately beneficial to those of a heavy nature.

5thly, That upon fresh land, or land in a proper state for calcareous application, lime is much superior to dung. Its effects continue for a longer period; while the crops produced are of a superior kind, and less susceptible of injury from the excesses of drought and moisture. Finally, the ground, particularly what is of a strong nature, is much easier wrought; and, in many instances, the saving of labor would almost tempt a judicious farmer to lime his land, were no greater benefit derived from the application, than the opportunity thereby gained of working it in a perfect manner.

It may be added, that though strong soils require to be animated with a good dose of lime, those of a light texture will do equally well with little more than half the quantity requisite on the others, especially if they are fresh, or have not already received an application of calcareous matter. In every case it is the farmer only who can judge of the quantity to be given; but, as a general principle, it is safer to exceed the proper quantity than to be below it. In the latter case the application may prove useless, and the whole expense be lost; whereas it rarely happens that injury is sustained from an excess, especially if more or less dung is soon after administered.

PRICE OF DURHAM CATTLE.

From the Genesee Farmer.

Many consider it a sufficient proof of false estimate of the value of Durham cattle, that the price is ten times greater than the animals would bring as beef in market, or than their proceeds amount to in the dairy.

In deciding this point, it must be remembered that their value does not depend on their qualities for immediate use, but on their means of increasing the breed. Two things should therefore be considered in determining their price. 1. Their products for beef and the dairy; 2. The time required for them to increase so as to afford a general supply for the country.

1. To determine their value for *immediate* use, it is requisite that we know how much the proceeds exceed the cost and keeping. One cow may produce but one-half more milk than another, and yet be ten times more profitable. If, for instance, the cost of keeping be $15 a year in both instances; and the produce of one be sixteen, and of the other, nine dollars. This shows the great im-

portance of those animals which will produce the largest quantities of milk and butter. When it is considered that Durham cattle, for beef and the dairy taken together, are much superior to any other breed, their value for real use may in some degree be appreciated.

2. Suppose that their ultimate price will fall to only twice the present value of our common cattle, and that half a century will be required for them to increase sufficiently to supply the whole country, a little calculation will show the safety of paying ten times that amount for them *now* for the purpose of increasing their number. For when we remember the enormous increase from a single cow in that period of time, it will be evident that the present price of such an animal, though it be a thousand dollars, will bear an exceedingly small ratio to the ultimate value of her progeny.

This subject may perhaps be rendered clearer, by supposing an analogous case. Suppose that a variety of wheat may be obtained which will produce, with the same culture, five bushels more to the acre than our common wheat. Of course the farmer who sows a hundred acres, would gain by the use of such seed, from five hundred to a thousand dollars annually at the present price. In buying the seed, therefore, (two hundred bushels or less,) he could well afford to pay more than twice the common price of wheat. Consequently, in buying wheat for the exclusive purpose of growing for seed, he could pay twenty times the common price. Reasoning in this way, it will be seen that a single pint, for increasing as seed, would at first be cheap at a thousand dollars; and until the country were generally supplied, the price might safely be put at many times its ultimate value.

Analogous reasoning will show that the price of Durham cattle is not fictitious, but depends on their real value. J. J. T.

RECEIPT TO CURE AN EGG-SUCKING DOG.

From the Franklin Farmer.

Many a brave and good dog has lost his life by too great a fondness for eggs, to avoid which hereafter, take three grains of tartar emetic and a tea spoonful of grated or scraped Indian turnip, stir them well together in an egg, give it to your dog and he will ever afterwards turn off in disgust if you offer him an egg—a simple, safe and *certain* remedy. W. P. HART.

MANAGEMENT OF BEES.

From the Maine Farmer.

Bees.—The following remarks on the management of bees, we copy from a small treatise on this subject by J. M. Weeks, of Salisbury, Vermont.

Bees swarm from nine o'clock in the morning to three o'clock in the afternoon on a fair day, differing in the season according to the climate. In Vermont they generally swarm from the middle of May to the fifteenth of July; in late seasons, some later. I have known them to swarm as early as seven in the morning, and as late as four in the afternoon. I have also known them to come forth when it rained so hard as nearly to defeat them, by beating down many to the ground which were probably lost from their colony: and I once had a swarm come forth on the sixteenth day of August.

I know of no rule by which the exact day of their first swarming can be known with certainty. The apiarian will estimate near the time by the number of bees in and about the hive, as it will become very much crowded.

The day of second swarming, and all after that during the same season, may be most certainly predicted as follows: Listen near the entrance of the hive in the evening. If a swarm is coming forth the next day, the queen will be heard giving an alarm at short intervals. The same alarm may be heard the next morning. The observer will generally hear two queens at a time in the same hive, the one much louder than the other. The one making the least noise is yet in her cell and in her minority. The sound emitted by the queens is peculiar, differing materially from that of any other bee. It consists of a number of monotonous tones in rapid succession, similar to those emitted by the mud-wasp, when working her mortar and joining it to her cells, to raise miss-wasps. If, after all, the weather is unfavorable to their swarming several days while in this peculiar stage, they will not be likely to swarm again the same season.

Experience and observation have taught that the queen leaves the old stock first, and her colony rapidly follow. They fly about a few minutes, apparentely in the greatest confusion, until the swarm is principally out of the hive. They then alight, generally on the limb of some tree, shrub or bush, or some other place convenient for them to cluster in a bunch not far from the old stock, and make their arrangements for a journey to a new habitation. Perhaps not one swarm in a thousand know where they are going until after they have left the old stock, alighted and formed into a compact body or cluster; and not then until they have sent off an embassy to search out a place for their future residence. Now if the bees are hived immediately after they have alighted, before they send off their embassy to seek a new tenement, they will never fly away, admitting they have sufficient room, (for it is want of room that makes them swarm in the first place,) and their hive is clear of every thing that is offensive to them.

No confusion or noise which is uncommon to the bees should ever be made during their swarming or hiving. The only effect of noise, ringing of bells, &c. that I could ever discover, was, to render them more hostile and unmanageable.

A clean hive is all that is needed for a swarm of bees, with careful and humane treatment.

A cluster of bees should never be shook or jarred any more than merely to disengage them from the limb or place where they are collected, nor should they fall any great distance, because their sacks are full when they swarm, which render them both clumsy and harmless, and harsh treatment makes them irritable and unmanageble.

When a swarm comes forth and has alighted, cut off the limb if convenient, unless a hiver is used—shake it gently, so as to disengage the bees and let them fall gently on to the table, board or ground, (as the case may be,) place the hive over them before many rise into the air, taking care at the same time to lay one or more sticks in such a manner as to raise the hive so as to give the bees rapid ingress and egress. If the bees act reluctantly in taking possession of their new habitation, disturb them by brushing them with a goose-quill or some other instrument not harsh, and they will soon enter. In case it is found necessary to invert the hive to receive the bees, (which is frequent from the manner of their alighting,) then first, secure the drawers down to the floor by inserting a handkerchief or something above them ; now invert the hive and shake or brush the bees into it; now turn it gently right end upon the table, or other place, observing the rule aforesaid.

GEESE AS BAROMETERS.

From the Quarterly Journal of Agriculture.

A recent tourist in the Highlands mentions a novel mode an inn-keeper had of ascertaining what would be the state of the weather:—"He has only to send his fleet of geese to the loch-side, and if they put out to sea, it will be fair; if they anchor on shore, it will be rainy."

MANUFACTURE OF CHEESE FROM POTATOES.*

From the Quarterly Journal of Agriculture.

Cheese, it is said, of extremely fine quality, is made from potatoes in Thuringia and part of Saxony, in the following manner:—After having collected a quantity of potatoes of good quality, giving the preference to the large white kind, they are boiled in a cauldron, and after becoming cool, they are peeled and reduced to a pulp, either by means of a grater or mortar. To five pounds of this pulp, which ought to be as equal as possible, is added a pound of sour milk, and the necessary quantity of salt. The whole is kneaded together, and the mixture covered up and allowed to lie for three or four days according to the season. At the end of this time it is kneaded anew, and the cheeses are placed in little baskets, when the superfluous moisture is allowed to escape. They are then allowed to dry in the shade, and placed in layers in large pots or vessels, where they must remain for fifteen days. The older these cheeses are, the more their quality improves. Three kinds of them are made. The first, which is the most common, is made according to the proportions above indicated; the second, with four parts of potatoes, and two parts of curdled milk; the third, with two parts of potatoes, four parts of cow or ewe milk. These cheeses have this advantage over other kinds, that they do not engender worms, and keep fresh for a great number of years, provided they are placed in a dry situation, and in well closed vessels.

PERFECT AGRICULTURE ADVERSE TO FENCES. NEW HERBAGE PLANTS.

From Loudon's Gardener's Magazine.

As the tendency of agricultural improvement in every country seems to be to stall-feeding, or, rather, to feeding in court-yards with sheds, instead of pasturing in fields, every attempt to make an addition to, or an improvement on, our herbage plants ought to be encouraged. Our idea is, that the time is not far distant when, in the best cultivated districts of Britain, the only animals pastured in the fields will be sheep; and that these will be folded on portions of verdant surface not larger than they can crop in a day or two, when they will be moved to a fresh portion. Hurdles or net-fencing will be used as substitutes for permanent fences; and then, of course, hedges and walls will no longer be wanted on most farms, except for an enclosure or two adjoining the farmyard. This will be a saving of the ground occupied by the fences, of their first cost, and of their annual keeping; while it will, at the same time, destroy the source whence are dispersed innumerable insects and seeds of weeds. In hilly countries and in valleys, which can be more profitably kept under perpetual grass than under the alternate system of herbage plants and corn, we do not say that fences will not continue to exist; but we have no doubt whatever of their sooner or later disappearing from all countries which can be subjected to the alternate husbandry; and more particularly where such countries have long dry summers, as is the case in most parts of the continent. On the greater part of the continent, indeed, there is no way of procuring manure sufficient for farming to advantage, but by consuming the herbage crops under cover, and saving and fermenting all the liquid matters produced in the farmyard and in the offices of the house. In this view of things, it will readily be conceived that we attach great importance to the improvement of old, or the introduction of new, herbage plants; and more especially of those tap-rooted or deep-rooting kinds which are adapted for countries having long dry summers. We have great pleasure, therefore, in introducing the following extract from the letter of an enlightened and scientific correspondent:—"I have four or five species of *heracleum* in cultivation, of the value of which I entertain great hopes, and some new grasses; one from Siberia. *Alopecurus nigricans*, seems to be valuable for its bulk and earliness, beyond most *gramineæ* whch we have hitherto had in cultivation. I think, too, that among several species of *sonchus hieracium*, which I am now trying, there are several which will be useful fodder plants on light silicious soil; of which, at a future time, when I see more about them, I may perhaps trouble you with an account." —*W. P. T. April 4th.* 1839. Any of our readers who have seeds of new herbage plants, or of plants which they think might prove useful as such, will greatly oblige us by sending a few, in order that we may forward them to our esteemed correspondent, W. P. T.—*Cond.*

SUGGESTIONS IN REGARD TO BUILDING FENCES AND LOG HOUSES.

To the Editor of the Farmers' Register.

Surry C. H., Va., May 28th, 1839.

I consider it a duty incumbent upon all, not only the farmer, but the doctor, lawyer, merchant and the mechanic, in short, every individual in the community, whatever his vocation may be, (as he is either directly or indirectly dependent for his support on the farmer,) to lend their aid in support of this all interesting subject, our mother agriculture.

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* An earlier and more full account of this practice was translated from a Belgian journal for the Farmers' Register. See page 268, vol. i.—Ed. F. R.

This aid and support from the larger portion of the farmers, I mean the little farmers, those with little education, may be expected to be limited; they have not the ability to do much, if they have the inclination. Their plan is a kind of a rote, a monotony, the practices followed by their fathers, their grand-fathers, and their great-grand-fathers; they seek no improvement, but remain perfectly reconciled to their poor crops and their land-murdering systems. The idea of the study of chemistry, botany, vegetable or animal physiology, geology, &c. with them seems as foreign to their business as law or physic. But to the intelligent, the reading class of our citizens, we must look for support. But with this class, how entirely negligent they are of their real interests! How few out of the many who are able to assist in the cause, ever take up a pen in its behalf—that even give to the public eye, in our agricultural journals their experiments in detail, their inventions, their discoveries, or any idea relating to, or touching that branch of science?

I have no experience in farming, consequently what I might say upon that subject, would be of but little avail, and therefore should be little in words; and shall at present only offer some hints.

On the construction of garden and lot fences.—Upon which, I propose, as I think, an improved plan. It is this: after laying off the size and form of an enclosure, for paling, railing or common rail or worm-fences, plough up with a double-plough to the full depth or a little beyond the soil a space of six, eight, or ten feet in width along the course designed for the fence. Then remove the soil so broken up, to any contigeous spot, and this, though poor and no better than the land on which it is put, will prove a manure in effect, for the depth of soil, good or bad, is very important. And along this trench build the fence. The width of the excavation, will of course, depend upon the kind of fence designed to be constructed thereupon. The advantages to be gained by this plan are, I think, several. The absence of the soil would prevent the growth of noxious weeds, briers and clusters of vines, &c., so common about gardens, lots and other spots of good land; the paling by being thus sunk would be somewhat protected from the winds, from the influence of the shade produced by the thickets of weeds, &c. so destructive to all timber; and in excessive wet weather the excavation would serve as a drain and a reservoir for the excess of water, &c. &c.

The durability of cypress poles, for ordinary out-house building seems to be not generally known. Poles or logs of this timber are far preferable to any made use of in this section for that purpose. Those who take durability into consideration, when cutting poles, would be well paid for their additional trouble in procuring cypress, if possible to be had in their vicinity at a reasonable expense. A friend of mine has now, in good and sound condition, a stable that was built of these about twenty years ago; and other out-buildings of later date, promising equal lasting. It is said by some that the bark should remain on the poles; but this I consider not important; they are used here both with and without the bark, and with no visible difference as to lasting.

Our neighbors are too much of an office-seeking people, a fortune craving people, for good farmers. Catching at any and all offices and employments that will take their attention away from their farming operations, for, (as they seem to think) the more honorable distinctions of, Mr.—Esq.—Colonel—Major—Captain, &c., who make so bold and conspicuous a figure among us, the farmers, the little ones.

I have thus, in obedience to my well wishes I have for agriculture, attempted to contribute my little, toward the advancement of that great source of human support. Should you excuse the rough and hasty manner in which it is jumbled together, and consider it of any value to your readers, then give it a place in the Farmers' Register, and at some more leisure day I will offer some words on a subject better deserving your attention.

By the Register's reader,
D. C. R.

TWO-CROP SILK-WORMS. FIXTURES FOR FEEDING AND SPINNING, &c.

To the Editor of the Farmers' Register.

Stafford, May 22nd, 1839.

Dear Sir—Yours of the 15th inst., is received, and I embrace the earliest leisure moment to reply to your several inquiries.

The variety of silk-worms called in the United States "two-crop," has been reared with success for many years in Connecticut, whence I originally procured my eggs. The eggs of this variety (if good,) invariably hatch twice, without the use of artificial means. Nothing more is necessary than to leave the eggs, procured from the first rearing, exposed where the moths have deposited them, and to notice them every morning between sunrise and 10 o'clock A. M. They usually hatch out in from three to ten days. Such as do not hatch (if any) cannot be relied on for the following year. Eggs for the latter purpose, must be procured from the second rearing. Eggs from other varieties sometimes hatch the same season, but they cannot be relied on for a second crop. I have never known this to occur but once under my observation, and then only four or five thousand hatched out of a lot of thirty thousand eggs.

The "two-crop" silk-worm moults *four* times; but in other respects it answers well to the description given by Dandolo of the *three-cast* worms. There is no worm as far as I have been able to learn, after diligent inquiry, in the United States that does not cast its skin *four* times.

The "two-crop" worm is hardy, stands atmospheric transitions better than most other varieties, and is not so liable to that terrible disease which the French called the *grasserie*. Whenever this disease breaks out in a cocoonery, it is vain to look for a tolerable result. It also spins a finer fibre, and for some purposes the silk produced commands from $1 to $2 per pound more than that from the ordinary varieties.

After three years spent in experimenting, I have adopted fixtures with which I am entirely satisfied. They are simple, economical, convenient, and (if I may use the expression,) meet the *instinctive views* of the silk-worms. I will describe them briefly.

I place pieces of scantling, extending perpendicularly from the floor to the joists, two feet apart, measuring across the cocoonery, and six feet distant, measuring lengthwise, leaving intervening alleys of two feet four inches for those who attend the worms to pass. I then bore holes in the scantling, with a half-inch auger, twelve inches apart so as to have six hurdles, one rising above the other. Ropes are then drawn through these holes, upon which light and moveable hurdles, three feet long and two wide, rest.

As these ropes are supported by timber at intervals of six feet, they may be drawn through a cocoonery 100 feet long, and yet be kept sufficiently steady. I use ropes in preference to timber, because every square inch added to the vacuum in a cocoonery is of importance. My hurdles are made of common pine laths an inch and a half wide and three-eighths of an inch thick. Two of these laths are laid down two feet apart, and then three cross pieces, two feet long, are nailed to them with small wrought nails, one at each end, and one in the middle. On this frame strong brown paper, such as is used in hardware stores, is pasted. You then have an elevated surface, so that the air can pass freely over the worms.

Oak bushes with the leaves on, I consider the best accommodations for the worms to wind on. These bushes should be gathered about a week before they are to be used, and spread in the shade in order that the leaves may become somewhat curled. Whenever a considerable number of worms manifest the disposition to spin, all of that particular age in the cocoonery, should be speedily placed on clean hurdles and arranged near together. Oak bushes should then be placed on the right and left, resting on the hurdles and tied to the upright timbers. The worms usually go to the edge of the hurdle and crawl along, frequently throwing up their heads, in search of something to climb on. By this arrangement, you will see that whether they move to the right or left, they are almost sure to come in contact with the bush. Other bushes must be placed along on one side as they are wanted, one end resting on the hurdle, and the other tied to the rope or timber immediately above. One side must of course be left open to distribute leaves to such of the worms as are still inclined to eat.

At the expiration of six or seven days, all the worms in this division that have not risen, must be taken away and accommodated on other hurdles, and three days thereafter the hurdles may be taken down and the cocoons gathered. The oak leaves do not crumble and the cocoons come out clean and in very good condition.

Before spinning, the worms void all excrementitious matter; and frequently before this is done, they climb up and assume the position for spinning. Under these circumstances the oak bushes are admirable to protect the cocoons already formed below. The precocious as well as the tardy worms are generally feeble, and must have their accommodations furnished them so that they may have but little climbing to do, and indeed whenever any of the worms are found wandering in search of a position for spinning, they must be taken and placed on the hurdles, and then left to do as they are inclined.

The attendant should be at the cocoonery very early every morning to attend particularly to these wanderers because at that time their number will be greatest.

Before a general disposition to spin is manifested, it is a good plan to have a bush at hand to accommodate the precocious spinners, until a systematic arrangement can conveniently be made.

You perceive that net-work has no place in my catalogue of fixtures. The reason may be found in the following experiments: In the summer of 1837 I prepared a net-work frame, three feet long, and two wide; at one end of this frame I placed an oak bush, at the other 500 silk-worms ready to spin. Of these, 499 passed across the net-work and formed their cocoons in the oak bush. In 1838 I altered this frame, giving it, as I supposed, a more convenient form. Again a bush was placed at one end, and 500 silk-worms at the other; and of these 498 formed their cocoons in the bush. I consider these experiments as showing conclusively that the silk-worms have no inclination to be on net-work, and therefore, I have declined the use of such hurdles.

Respectfully yours,
LAYTON Y. ATKINS.

P. S. I have answered your queries as fully as is desirable, and if yon are inclined to publish the suggestions you can do so.

My silk-worms have not yet commenced spinning, but they appear to be doing very well. A few days before spinning, however, is generally the critical period, as to the breaking out of diseases.

I will venture to remind you of G. B. Smith's caution against "over-cropping," as new beginners are in danger of suffering by it. He says that we should be sure of having nearly double as much foliage as would sustain the worms brought out. Last year a gentleman at Washington lost his worms in this way.

Another injury which results from "over-cropping" is stripping of the trees too closely the first season; it has a very bad effect on the *after-growth* of the trees. The morus multicaulis is a very hardy tree; it is, nevertheless, governed as to its growth by the same laws which operate on other trees, and may be injured by excessive defoliation. The leaves should be taken cautiously while the stalks are green and succulent, indeed I should not venture to take any leaves earlier than 20th June, and then very sparingly. In order to be ready for early feeding, the tops must be left on the trees. I am aware that Dr. Stebbins and some others have said you may begin to take the leaves when the plants are one foot high, and that the trees are not injured by it. Dr. Stebbins also recommended that silk-worm eggs be put in bottles hermetically sealed, and placed in ice-houses. Those who followed his advice brought out their eggs and exposed them for hatching, but no worms made their appearance.

L. Y. A.

METHOD OF CAUSING CABBAGES TO HEAD DURING THE WINTER.

From the Maine Farmer.

In the fall of the year when it is time to gather cabbages, we always find more or less of them that have not formed any heads. They may have grown well and have a large stock of leaves, but have not closed up in the form necessary to make a good, solid, compact cabbage.

William Vance, Esq. of Readfield, has practised for many years the following method, which effectually closes these loose leaves in the course of the winter, thereby furnishing him with a supply of the best kind early in the spring. In the fall of the year, just before the ground closes up he gathers all the cabbages which have not headed, together. He then digs a trench eighteen inches or more, deep, and of sufficient width to admit the cabbages. He then closes the leaves together by hand, winding a wisp of straw or something else around them to keep them together; and then puts them into this trench, with heads down and roots up. He then packs straw or leaves, and earth snug about them, and rounds up the earth over them. The trench should be dug in a place where the water of the rains and the snows runs off, and will not stand about them. A board, or a couple of boards, nailed together in the form of a roof and put over the mound, may be useful.

In the spring of the year open your trench, and you will find that your cabbages are all headed firmly together, and if the water has not got in, will be solid and hard, Mr. Vance, has had the goodness to send us a few heads which he has formed in this way, which were very nice. By following this plan, we not only preserve the cabbages well during the winter, but save much of the crop which is not considered worth much.

SAVING GREEN PEAS.

From the same.

Mr. Vance informs us that he preserves green peas for winter use, simply by shelling them and putting them into bottles, and corking them very tightly. They should be used as soon as the bottle is open. In this way you may have green peas all winter, if you like.

IMPROVED DURHAM SHORT-HORNS.

From the Whip.

For every portion of the text in this excellent account of the short-horns, we are indebted to the Rev. Henry Berry, than whom there are few more zealous breeders of cattle, while there is no better judge of them.

Whatsoever differences of opinion may prevail respecting the comparative merits of our several breeds of cattle, it must be admitted that the short-horns present themselves to notice under circumstances of peculiar interest. Possessing in an eminent degree a combination of qualities which have generally been considered imcompatible, and rendered irresistibly attractive to the eye by their splendid frames, and beautifully varied colors, it is not surprising that they have become objects of public curiosity; that they have realized for their breeders enormous sums of money; and that, throughout our own island, and in every foreign country where agriculture is attended to, they are in increasing request.

It might tend to throw much light on the science of feeding, could these animals be traced, in the progress of their improvement, to an earlier period than has hitherto been found possible. Of the extent of that improvement we may, however, form an estimate, by placing together one of the improved, and one of the unimproved race. We should, in such a case, discover resemblance just sufficient to support the belief in a very remote alliance, but there all similarity would cease.

From the earliest periods as to which we have any accounts of our breeds of cattle, the counties of Durham and York have been celebrated for their short-horns, but principally, in the first instance, on account of their reputation as extraordinary milkers.

Before this, a large and valuable description of cattle had existed on the western coast of the continent of Europe, and extending from Denmark to the confines of France. They were celebrated for the great quantities of milk which they yielded, and some of them exhibited an extraordinary aptitude to fatten. At what particular time they found their way to England, or by whom they were imported, is unknown; but there is a tradition that, towards the close of the seventeenth century, a bull and some cows were introduced into Holderness.

In external form, there appeared to be very little to recommend them, for they had large shoulders and coarse necks; the sides were flat, and the head was thick; all the coarse parts were bulky, and the prime ones were reduced in size, and they were almost the reverse of what the agriculturist would select: they were, however, bulkier than the native breeds, and they were better milkers than the generality of the cattle of that day. They would, by dint of feeding, grow to an enormous size; but they had not the aptitude to fatten, nor the early maturity, to which they have been since indebted for their triumph over every other breed. To recite their recorded feats at the pail would be to invite incredulity; but it may be asserted, on the best evidence, that, taken as a breed, they have never in that particular been equalled. The cattle so distinguished were always, as now, very different from the improved race. They were generally of large size, thin-skinned, sleek-haired, bad handlers, rather delicate in constitution, coarse in the offal, and strikingly defective in the substance of girth in the fore-quarters. As milkers, they were most excellent; but when put to fatten, as the foregoing description will indicate, were found slow feeders, producing an inferior quality of meat, not marbled or mixed as to fat and lean, and, in some cases, the latter was found of a particularly dark hue. Such, also, are the unimproved short-horns of the present day, and the distinction cannot be too frequently asserted, because they are, in many cases, considered as specimens of the improved breed, and have actually been resorted to in trials as to the comparative aptitude of animals to fatten—trials which it is evident they could not successfully sustain.

A period of more than eighty years has now elapsed, since the short-horns, on the banks of the river Tees, hence called the Teeswater breed, had assumed a very different character to that contained in the foregoing description. In color, they resembled the improved short-horns, being occasionally red, red and white, and roan, though the last named color was not then so prevalent as now. They possessed a fine mellow skin and flesh, good hair, and light offal, particularly wide carcasses, and fore-quarters of extraordinary debth and capacity. Perhaps no closer modern resemblance can be found to the above description of the Teeswater breed than Mr. Berry's bull presents. His dam was purchased by Mr. B. on account of the very few crosses that intervened between her and some of the best of the Teeswater cattle, to which he was desirous to go back, on account of the extent to which breeding *in-and-in* has been carried. When slaughtered, their proof was extraordinary, and many instances are recorded of the wonderful weight of their inside fat.

The remarkable difference which existed between the Teeswater and the old unimproved short-horns may, with propriety, be ascribed to a spirit of improvement which had some time manifested itself among the breeders on the banks of the Tees, whose laudable efforts were well seconded by the very superior land in the vicinity of that river. No reasonable doubts can be entertained that they proceeded on a judicious system of crossing with other breeds, because it was utterly impossible to raise such a stock as the Teeswater from pure short-horn blood. One cross to which they referred was in all probability, the white wild breed; and if this conjecture be well-founded, it will be apparent whence the short-horns derived a color so prevalent among them.

It is also asserted that, about the period in question, Sir William St. Quintin, of Scampston, imported bulls and cows from Holland, which were crossed with the stock of the country. It would tend to little advantage to proceed with conjectures, as to what other breeds were resorted to, if any; this much is certain, that great improvement was soon manifested, and a valuable variety established, as the two following instances will prove.

Mr. Milbank, of Birmingham, one of the leading improvers, bred and slaughtered an ox, which, at five years old, weighed, the four quarters, one hundred and fifty stones, of fourteen pounds to the stone, producing sixteen stones of tallow; and a cow bred from his stock, slaughtered by Mr. Sharter, of Chilton, at twelve years old, weighed upwards of one hundred and ten stones.

From Mr. Milbank's time, the Teeswater cattle continued to sustain their excellence and celebrity in various hands, until Mr. Charles Colling adopted them, when he manifested a superiority of skill as a breeder, which, in a very brief period, secured him an ample fortune.

Whatever had been the merits of the Teeswater cattle, it is certain Mr. Colling greatly improved them; and though it has been asserted that his success was the result of chance, arising from the possession of an animal, with the merits of which, it is supposed, he was at one period unacquainted, the writer of this article is of opinion that Mr. Colling's success resulted from a deliberate and well-considered plan. He found the Teeswater, like all other extravagantly large cattle, frequently of loose make and disproportion. He was sensible, also, of the difficulty of breeding, with anything like certainty, *large good* animals; and though he has declined on all occasions to throw any light on his views and proceedings, the writer thinks he can detect, in the very outset, and through the progress of his practice, a resolution to reduce the size of this breed, and at the same time, and by that means, to improve its form. This he is supposed to have effected, in the first instance, through the medium of a bull, called "*Hubback*," an animal respecting which there has been much controversy, principally touching the purity of his blood, a question now of little importance, because it is admitted on all hands that Mr. Colling adopted another cross, which prevails in a majority of superior short-horns of the present day. It may, notwithstanding, be matter of interest to state a few particulars respecting this bull.

Without entering on an inquiry by what circumstances Hubback's title to be considered of pure blood is supported or weakened, it may suffice to observe, that it appears probable he possessed on one side the imported blood. The possessor of his dam was a person in indigent circumstances, and grazed his cow in the highways. When afterwards she was removed to good land, near Darlington, she became so fat that she did not again breed; and her son, having the same feeding propensity in a high degree, was useful as a bull during a very short period. The quality of the flesh, hide and hair, are supposed to have been seldom equalled; and as he was smaller than the Teeswater cattle, he was eminently calculated to forward Mr. Colling's views.

It has been remarked that we have at present no superior horse on the turf, which does not boast the blood of the Godolphin Arabian; so it may be asserted that we have no superior short-horns which do not claim descent nearly, or remotely, from Hubback; because Hubback was the sire of the dam of Mr. Charles Colling's bull, Foljambe, who was the grandsire of Favorite; and there can be no doubt that there has not been for many years any superior short-horn who was not descended from Favorite. Mr. Charles Colling is said to have considered that the bull Foljambe was the one who did his stock the greatest good; and this is not improbable, as Foljambe was the sire both of the sire and dam of Favorite. Hubback, however, must have been a remarkably good animal, and considering the short time *during* which he was used as a bull, proved himself a first-rate stock-getter.

The following account of Hubback we had from Mr. Waistell, or Alinill, who, although his name does not appear conspicuously in the 'Short-Horned Herd Book,' deserves much credit for his discrimination here. He used to admire this calf, as he rode almost daily by the meadow in which it grazed; and at length he attempted to purchase it from the owner. The price asked, £8, seemed much for a calf not a year old; and the reputation of the short-horns not being yet established, the bargain was not struck. Still he longed for the young beast; and happening to meet Mr. Robert Colling near the place, he asked his opinion of the animal. Mr. Colling acknowledged that there were some good points about him; but there was something in his manner of acknowledging this, which induced Mr. Waistell to suspect that Mr. Colling thought somewhat more highly of the calf than his language expressed, and, therefore, he hastened the next morning, concluded the bargain, and paid the money. He had scarcely done so before Mr. R. Colling arrived for the same purpose, and as the two farmers rode home together, they agreed that it should be a joint speculation.

Some months passed by, and either Mr. Waistell's admiration of the calf a little cooled or his partner did not express himself very warmly about the excellencies of the animal, and Messrs. Waistell and R. Colling transferred young Hubback to Mr. C. Colling; who, with the quick eye of an experienced breeder, saw the value of the little beast. Mr. Waistell expressed to us (October, 1832) his regret (natural enough) at having been induced to part with the sire of the short-horns, and his extreme disappointment that when Hubback began to cover, Mr. Charles Colling confined him to his own stock, and would not let him serve even one of Mr. Waistell's cows.

After the use of this bull, Mr. Charles Colling proceeded with singular success to produce, from time to time, superior animals; and the number of bulls he disposed of by letting was highly encouraging. But the circumstance which brought the improved short-horns into most extensive notice was the production of the "Durham Ox," an animal which speaks volumes in favor of even a single cross of this blood; for the ox was the produce of a common cow, which had been put to "*Favorite.*" At five years old, the Durham ox was sold to Mr. Bulmer, of Harmby, near Bedale, for public exhibition, at the price of £140; this was in February, 1801. He was at that time computed to weigh 168 stones, of 14lb, his live weight being 216 stones; and this extraordinary weight did not arise from his superior size, but from the excessive ripeness of his points. Mr. Bulmer having obtained a carriage for his conveyance, travelled with him five weeks, and then sold him and the carriage. at Rotherham, to Mr. John Day, on the 14th May, 1801, for £250.

	£.	*s.*	*d.*
On the 14th of May, Mr. Day could have sold him for - -	525	0	0
On the 13th of June, for - -	1000	0	0
On the 8th of July, for - -	2000	0	0

Mr. Day travelled with him nearly six years, through the principal parts of England and Scotland, till at Oxford, on the 19th February, 1807, the ox dislocated his hip-bone, and continued in that state till the 15th April, when he was obliged to be slaughtered; and, notwithstanding he must have lost considerably in weight, during these eight weeks of illness, his carcass weighed—

	Imp. stones.	lbs.
Four quarters - -	265	12
Tallow - - -	11	2
Hide - - - -	10	2

This was his weight at eleven years old, under all the disadvantages of travelling in a jolting carriage, and eight weeks of painful illness. Had he been kept quietly at Ketton, and fed till seven years old, there is little doubt but he would have weighed more than he did at ten years old, at which age Mr. Day stated his live weight to have been nearly thirty-four hundred weight, or two hundred and seventy stones, from which if fifty be taken for offal, it leaves the weight of the carcass two hundred and twenty stones.

It is a well ascertained fact, that, during his career as a breeder, Mr. Colling tried several experiments in crossing, and the breeds to which he resorted on these occasions, being very considerably smaller than the short-horns, this circumstance tends to corroborate the writer's opinion that he considered it desirable to reduce their size. The cross with the Kyloe led to no results worthy enumeration, but that with the *polled Galloway* must not be passed over without comment. Before stating the circumstances attending this experiment, it may be proper to observe that no breed of cattle promised so successful a cross with the short-horns as the Galloway. They were calculated, by their deep massive frames and short legs, to bring the short-horns nearer the ground, and to dispose their weight in a more compact manner: their hardy habits would be essentially useful, and the quality of their flesh and hair were such as to render the experiment still more safe. Add to this, that they could be obtained of a red color, and we are prepared to admit, even without the sanction of a successful experiment, that they were admirably adapted to cross with the short-horn, standing frequently too high from the ground. not very well ribbed home, and not seldom of loose, disjointed frame.

To this breed Mr. Colling resolved to resort; and though at the time when he did so, the event was regarded with some degree of ridicule by the pure blood advocates, and comments passed which would have deterred ordinary men from the exercise of their judgment, Mr. Colling persisted.

He was much favored by circumstances in promoting his object, which was to take one cross, and then breed back to the short-horn,—the only course, by the way, in which crossing can be successfully adopted. To breed from the produce of a cross *directly among themselves* will lead to the results which have induced many persons, without due consideration, to believe conclusive against crossing; but to take one cross, and then return and adhere to one breed, will, in the course of a few generations, be found to stamp a variety with sufficient certainty.

Mr. Colling's short-horned bull *Bolingbroke* was put to a beatiful red-polled Galloway cow, and the produce, being a bull-calf, was. in due time, put to *Johanna*, a pure short-horn,—she also produced a bull-calf. This grandson of Bolingbroke was the sire of the cow, *Lady*, by another pure short-horned dam, and from Lady has sprung the highly valuable family of improved short-horns, termed, in reproach, the *alloy*. How far the alloy was derogatory, let *facts* testify.*

It will probably be admitted that the prejudice against this cross was at the highest at the time of Mr. Charles Colling's sale. The blood had then been little, if at all, introduced to other stocks, and it was manifestly the interest, whatever might be the inclination, of the many breeders who had it not, to assume high ground for the pure blood, and to depreciate the alloy. Under these untoward circumstances for the alloy, what said public opinion, unequivocally certified by the stroke of the auctioneer's hammer? *Lady*, before-mentioned at fourteen years old, sold for two hundred and six guineas. *Countess*, her daughter, nine years old, for four hundred guineas. *Laura*, another daughter four years old. for two hundred and ten guineas. *Major* and *George*, two of her sons, the former three years old, the latter a calf, for two hundred guineas and one hundred and thirty; beside a number of others, more remotely descended from Lady, which all sold at high prices; in fact, in a sale of forty-eight lots, realizing £7115 17*s*. Lady and her decendants sold for a larger sum than any other family obtained.

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*The dam of Lady was also the dam of the bull Favorite: and as the grandson of Bolingbroke is not known to have been the sire of any other remarkably good animal, it is most probable that the unquestionable merit of Lady and her descendants is to be attributed more to her dam than to her sire.—*Edit.*

As a specimen of the alloy, the reader is referred to Mr. Berry's cow. She gives a moderate quantity of particularly rich milk.

It would answer no useful purpose, and would certainly be an objectionable course, to bring under particular notice any one or more of the highly valuable stocks of improved short-horns of the present day. To enumerate all would be impossible; and the writer of this account would most studiously avoid any partial or invidious comparison. The same objection does not, however, exist as to a remote period; and it is but justice to state that Mr. Robert Colling, brother of Mr. Charles, (who certainly was the leader, and surpassed all competitors in the improvement of the short-horns,) Mr. Charge, of Newton, near Darlington, and Mr. Mason, of Chilton, in the county of Durham, were only second to Mr. Charles Colling in his interesting and useful pursuit. Mr. Mason started early with animals derived, it is believed, from Mr. Colling, in the very commencement of his career; and Mr. Charge, who had long possessed a most valuable stock of Teeswater cattle, had at an early period crossed them with Mr. Colling's best bulls, and was one of the spirited purchasers of Comet, at a thousand guineas. Mr. Mason's late successful sale sufficiently stamps the value of his stock at that period, but it is generally admitted, the system of crossing with other herds, which he had of late years judiciously adopted, proved highly instrumental in restoring those qualities in his own, which too close breeding had in some degree threatened to deprive them of.

It would be unfair, on this occasion, to omit mention of a veteran breeder, to whom the advocates for the preservation of pedigree are indebted for the *Short-horn Herd Book*—Mr. George Coates. He is now one of the oldest authorities on the subject in existence, and was once the possessor of a very superior race of short-horns, hough somewhat coarse. Portraits have been preserved of some very fine animals bred by him; and he had the solid satisfaction to dispose of his bull *Patriot* for five hundred guineas.

Mr. Coates fell into an error, but too common, and generally equally fatal: he fancied his own stock the best, and disdained to cross them with Mr. Colling's; which, as others afterwards proved, would have been a most judicious proceeding. The consequence was, Mr. Colling's sale having settled the public judgment and taste, Mr. Coates' stock fell into disrepute. If an apology be requisite for this statement of an undeniable fact, it will be found in the utility of holding up such an example as a caution to those who may be in danger of falling into a similar error.

In the commencement of this account, however it was stated that they possess a combination of qualities, hitherto considered incompatible. It will be obvious that the dispositon to feed rapidly, in union with dairy qualifications, is here intended.

It might have the appearance of an intention to depreciate other breeds of cattle, were an inquiry instituted how the very general impression came to be entertained that animals disposed to fatten rapidly seldom give much milk. It is unquestionably true, that every perfection in cattle—whether it be one of form, of quality of flesh, of disposition to fatten, or to yield milk—can be promoted and retained solely by the breeder's devoted attention to his particular object; and if one object be allowed a paramount importance in the breeder's estimation and practice, other objects will suffer in proportion as they are neglected.

The improvement in the carcass of the short-horns has been so surprising, and so justly valued, that many persons have allowed that completely to occupy their attention, and the dairy has been disregarded. In such a state of things, every advance towards one point has been tantamount to receding from another; because the same proceeding which tends to enhance a particular quality, will also enhance a defect, provided such defect, was of previous existence.

This may be rendered more intelligible by a short illustration. Suppose half a dozen animals to be selected in consequence of their possessing a particular quality; which quality it is proposed, *on a* certain established principle of breeding, *to increase* and render almost permanent by their union. Suppose the animals so selected to come from the hands of breeders who have neglected the milking property; the certain consequence will be, that the very union which developes and secures the desired object will tend, on the same *principle*, to increase the defect as to milk. In short, it will render it *habitual* in the produce. But this illustration, by a *selection*, is supposing too much for the probable state of the case. The objections which exist among breeders, for various and some cogent reasons, against crossing with the stocks of each other, unavoidably lead to the practice of breeding in-and-in; which, in case of any original deficiency of the milking property, must unquestionably go on to render that deficiency greater. It is hence evident that bad milking, in a breed of animals which were ever *distinguished* as good milkers, is not a necessary consequence of improvement in the animal in other respects, but a consequence of the *manner* in which such improvement is pursued. This the writer considers to be the reasoning properly applicable to the subject; which happily also admits of a satisfactory appeal to facts; and he is strictly justified in asserting that improved short-horns, inferior to none for the grazier, may always be selected and bred with the most valuable dairy properties. Perhaps a more plentiful and steady milker than the dam of Mr. Berry's bull, never stood over a pail, and few such carcasses of beef have been exhibited as hers, when an accident rendered it requisite to only half-feed her. The bull himself has an extraordinary disposition to carry flesh, and his calves are let down in the udders like *miniature* cows. In fact, all the bull's family are excellent for the pail, and the quickest possible feeders. The writer has known many instances of the highest bred short-horns giving upwards of four gallons (wine measure) of milk, night and morning; and it is certain that attention only is requisite, on the part of the breeder, to perpetuate this quality in any desirable extent. While on this subject, it is proper to observe, that the excessive quantities of milk obtained from the unimproved short-horns are seldom or ever obtained from the improved; but a moderately good milker of the latter kind will be found to yield as much *butter* in the week, as one of the former: the milk being unquestionably of very superior quality; and indeed, it was likely such should be the case, and that the artificial change in the animal economy, which leads to an excessive secretion of flesh and fat, should also be productive of other rich secretions. Within the last three or four years, affidavits were sworn before a magistrate in America, that an improved short-horned cow, imported thither, produced after the rate of 20 lb. of butter per week.

Wherever the improved short-horns have been crossed with other cattle, their superiority is equally manifest, in respect of dairy qualifications, as in every other. On this subject the writer is able to avail himself of the evidence of a gentleman who has addressed a communication on the subject to the conductor of the *British Farmer's Magazine*, which is so pertinent to the present subject that the temptation to take an extract is irresistible. It is as follows: "In the 27th number of your valuable magazine, when giving an account of my two-years'-old steer, you also give an extract from my letter on the advantages of crossing cows of different breeds with improved short-horn bulls; and in confirmation of this opinion, (not hastily adopted, but the result of several years practical experience, and a close attention to the experiments of several friends during the last seventeen years,) I send you the portrait and a short account of a two-year old Durham and Devon heifer of mine, lately slaughtered by Mr. William Daniel, of Abergavenny, and accompany it with a few brief statements of the advantages derived from this system by several of my own personal friends.

"This heifer was the second cross, and was of a light gray color. She weighed 35 scores and 8 lb.; rough fat, 98 lb.; she was allowed to be the fattest and best beast of her age, in all points, ever seen in Abergavenny. She had a dead calf about six weeks before Christmas; was dried the 17th of January, and killed the 10th of June. She sold for £19 3*s*. 6*d*.

"Her live weight, on the 8th of June, was - - -	1232 lbs.
Ditto, on the 17th January -	840
Increase in 140 days - -	392

"Being aware that strong prejudice and much incredulity existed on the subject of crossing, I courted the attention of all the respectable farmers, breeders, and feeders in this neighborhood. Many came to see her when first put up, and repeatedly afterwards during the five months she was feeding; and they all concurred in saying she went on faster than any beast they had ever seen. She never had any oil-cake.

"I have seen many excellent beasts bred from *improved* short-horn bulls and long-horn cows: indeed I never knew one of these bulls put to any cow, where the produce was not superior to the dam; but the cross which I advocate, and with which I am best acquainted, is that with the Devon cow. I have uniformly remarked, that each succeeding cross was attended with a proportionate improvement in size, quality of flesh, and aptitude to fatten. In every instance they have shown themselves superior milkers, and stand to the pail till within six or eight weeks of calving; and several instances have come under my own knowledge where they have never been dry since they first calved; and so highly are they prized as milkers, that a friend of mine, who hired out dairies, informed me that the dairymen gave him nearly 2*l*. per cow per year more for the half and three-quarter breds, than they would give for cows of other breeds.

"A friend of mine had about a dozen North Devon cows, small in size, but nice in quality, and from these he commenced, about twenty years since, breeding with short-horn bulls. He has since invariably used those bulls. With each succeeding cross the stock have rapidly improved in every essential, and the only trace of the Devons which I could preceive when I last saw them, about two years since, was a peculiar richness in their color. He breeds about thirty annually, and generally sells his three-years-old, in the autumn, at £17 to £22; and I have known him to sell in-calf heifers to jobbers in fairs as high as 30 guineas each. All his stock are superior milkers. Here we have twenty years' experiment and continued improvement.

"Within the last eight years I have sent many North Devon heifers to Ireland, to friends residing in different counties, and some of them occupying land of very inferior quality. I also sent over two young Durham bulls, from the stock of the Rev. Henry Berry, to cross them with. They have all crossed them with short-horn bulls at my recommendation, and the accounts they give are most satisfactory. They say the two-years old half-breds are as good as the three-years old Devons, and are all good milkers. One of these bulls, by Mr. Berry's *Mynheer*, has been four times exhibited in three different counties, and has each time taken the first prize. He was last year sold for 60 guineas, and is now serving cows at £1 each.

C. H. Bolton.

"*Brynderry, near Abergavenny.*"

An opinion generally prevails that the short-horns are unfitted for work; and in some respects it is admitted they are so; but the correct reason has not been assigned, and the question may fairly come briefly under notice. That they are willing and able to work, the writer knows, from one in particular among many instances. He has now a team of two-years old steers, working constantly nine hours a day; a system he would by no means recommend, and forced on him by circumstances connected with entrance on a new farm, at present ill adapted to grazing cattle. They work admirably; but surely cattle which, as the preceding account proves, will go as profitably to the butcher at two years old as any other breed at three, and as many even at four, ought never, as a general rule, to be placed in the yoke. No beast in the present advanced state of breeding, ought to be put upon a system which arose out of the necessity of obtaining compensation by work for the loss attending a tardy maturity. But where it may be convenient, the short-horns, particularly the bulls, work admirably, as their great docility promises; and there are many operations going on in every farm which a bull would be judiciously employed in performing. And as the bulls of this breed are apt to become useless, from acquiring too much flesh in a state of confinement, moderate work might, in most case, prove beneficial for such as are intended for use at home.

With deference, however, it is submitted to the breeders of short-horns that they should avoid breeding from too close affinities, and while they steer clear of coarseness, should require a sufficiency of *masculine* character in their males.

Lord Althorp first adopted the short-horns in 1818, when he purchased the bull *Regent* at Mr. R. Colling's sale, with several of that gentleman's cows; and since that time his lordship has been unremitting in his attempts to improve the breed. The bull *Firby* is good in almost every point. His flanks, loins, hips, and bosom are excellent. His only failing is in the crop; yet we are told by his lordship's very intelligent steward, (Mr. Hall,) and we had proof of the accuracy of the observation, when we had the pleasure of looking over the Wiseton herd, that after using him six years, very few of his stock have inherited this imperfection. Lord Althorp's bull *Firby* evinces this requisite in a proper degree. He has also—but, indeed, it is only part of the other, for without it good masculine character cannot exist—an excellent loin. This is a point in which many short-horns are rather defective, and it is one of infinite importance. Add to this, that if, in many instances, the length of the carcass were abated, as well as that of the legs, a hardier animal, with equal size and on a more profitable scale, would be produced. The facilities for making this improvement are sufficiently numerous, the short-horns being now more generally diffused. That wider diffusion also multiplies the means of selecting for milk; a quality which should not be lost sight of: for it is the *combination* of perfections which has conferred, and will perpetuate, the superiority of this breed of cattle.

The colors of the improved short-horns are red or white, or a mixture of the two, combining in endless variety, and producing, very frequently, most brilliant effect. The white, it is very probable, they obtained from an early cross with the wild breed; and whenever this color shows itself, it is accompanied, more or less, with a red tinge on the extremity of the ear: a distinctive character, also, of the wild cattle. No *pure improved short-horns* are found of any colors but those above named. There is a large coarse short-horn, prevailing particularly in Lincolnshire, denominated in the quotations of the Smithfield markets "Lincolns," and generally sold at prices below those of any other cattle. These are frequently black, black and white, blue and dun; but they have no further affinity with the improved short-horns than as the latter have been referred to for their improvement, which has been accomplished to a considerable degree. A similar description of large, coarse short-horns, of these objectionable colors—for they generally accompany a bad quality of flesh—prevails in some of the midland counties. They are great consumers of food, gutty, and particularly low and bad in the loins, with excessively heavy shoulder-blades. The owners of this stock, however, are crossing with the improved breed; but the dairy-farmers of Gloucestershire are so much alive to the superiority of the short-horns, that they lay hold with avidity of any thing which approaches them in color, or is called by the name. Indeed, should this breed continue to obtain the requisite attention, to maintain in its present excellence, it is not too much to suppose that it will, before long, alter the character of the cattle in most of the great breeding districts. It would have been thought incredible some years ago, but is nevertheless the fact, that they are treading closely on the strongholds even of the Herefords; and an observing traveller, who sees their colors staring to view in very unwonted situations, must pronounce them universal intruders.

Thus far Mr. Berry, whose admirable account of the improved short-horn cattle, our readers will duly estimate. There is no point which he has more triumphantly illustrated than the value of of this breed, as containing a combination of perfections. It was a point which was in a manner lost sight of by the early improvers. They developed the aptitude to fatten, and the early maturity of the short-horns, but they neglected, and were beginning to lose, their milking properties. This is also the grand error of many modern breeders; and hence arose the general impression, and founded on careful observation, that in proportion as the grazing properties of the beast were increased, its value for the dairy was proportionably diminished.

The Yorkshire cow, which now almost exclusively occupies the London dairies, is an unanswerable proof of the possibility of uniting the two qualities to a degree of perfection, *but not at the same time*:—they succeed to each other, and at the periods when it suits the convenience of the dairyman that they should. Twenty years ago the Yorkshire cow was, compared with other breeds, as great a favorite in the London market as at present. She yielded more milk, in proportion to the quantity of food consumed, than could be obtained from any other breed; but when the dairymen had had her four years, she began to fall off, and he dried her, and sold her. It took a long time to get much flesh upon her *bones*; *and* when he calculated the expense of bringing her into condition, he found that his cheapest way was to sell her for what she would fetch, and that seldom exceeded 5*l.*

By degrees, however, some of the more intelligent breeders for this market began to find that, by cautiously adopted Mr. Berry's principle of selection—by finding out an improved short-horn bull, whose progeny were generally milkers, and crossing some of the old Yorkshires with him, and then going back to the pure blood—but still regarding the milking properties of the dam—and the usual tendency to possess these qualities in the offspring of the sire—they could at length obtain a breed that had lost little of the grazing properties of the new breed, and retained, almost undiminished, the excellence of the old breed for the pail. Thence it has happened that many of the cows in the London dairies are as fine specimens of the improved short-horn as can possibly be produced. They do not, perhaps, yield *quite* so much *milk* as the old ones, but what they do yield is of better quality; and whether the dairyman keeps them a twelve-month, or a little longer—and this is getting more and more the habit of these people—or whether he milks them for three or four years, as soon as he dries them, they fatten as rapidly as the most celebrated of the improved breed. Mr. Parkinson gives an account of one which, after being milked on the 5th of April, was sent to grass with others, and sold on the 5th of July, after ninety-one days grazing, having made in that time nearly two shillings a day.

The Yorkshire cow is a fair specimen of one of these cows—the character of the Holderness and the Durham beautifully mingling. A milch cow, good for the pail as long as she is wanted, and then quickly got into marketable condition, should have a long and rather small head; a large-headed cow willl seldom fatten or yield much milk. The eye should be bright, yet with a peculiar placidness and quietness of expression; the chaps thin, and the horns, small. The neck should not be so thin as that which common opinion has given to the milch cow. It may be thin towards the head; but it must soon begin to thicken, and especially when it approaches the shoulder. The dewlaps should be small; the breast, if not so wide as in some that have an unusual disposition to fatten, yet very far from being narrow, and it should project before the legs; the chine, to a certain degree fleshy, and even inclining to fulness; the girth behind the shoulder should be deeper than it is usually found in the short-horn; the ribs should spread out wide, so as to give as globular a form as possible to the carcass, and each should project farther than the preceding one to the very loins, giving, if after all the milch cow must be a little wider below than above, yet as much breadth as can possibly be afforded to the more valuable parts. She should be well formed across the hips and on the rump, and with greater length there than the milker generally possesses; or if a little too short, not heavy. If she stands a little long on the legs, it must not be too long. The thighs somewhat thin, with a slight tendency to crookedness, or being sickle-hammed behind: the tail thick at the upper part, but tapering below; and she should have a mellow hide, and little coarse hair. Common consent has given to her large milk-veins; and although the sub-cutaneous or milk-vein has nothing to do with the udder, but conveys the blood from the fore part of the chest and sides to the inguinal vein, yet a large milk-vein certainly indicates a strongly developed vascular system—one favorable to secretion generally, and to that of milk among the rest.

The last essential in a milch cow that we shall mention is the udder, rather inclining to be large in proportion to the size of the animal, but not too large. It must be sufficiently capacious to contain the proper quantity of milk, but not too bulky, lest it should thicken and become loaded with fat. The skin of the udder should be thin, and free from lumps in every part of it. The teats should be of moderate size; at equal distance from each other every way; and of equal size from the udder to nearly the end, where they should run to a kind of point. When they are too large near the udder, they permit the milk to flow down too freely from the bag, and lodge in them; and when they are too broad at the extremity, the orifice is often so large that the cow cannot retain her milk after the bag begins to be full and heavy. The udder should be of nearly equal size before and behind, or, if there is any difference, it should be broader and fuller before than behind.

The quantity of milk given by some of these cows is very great. It is by no means uncommon for them, in the beginning of the summer, to yield 30 quarts a day; there are rare instances of their having given 36 quarts; but the average measure may be estimated at 22 or 24 quarts. It is said that this milk does not yield a proportionate quantity of butter; and that although these cows may be valuable where the sale of milk is the prime object, they will not answer for the dairy.

That their milk does not contain the same proportionate quantity of butter as that from the long-horns, the Scotch cattle, or the Devons, is probably true; but we have reason to believe that the difference has been much exaggerated, and is more than compensated by the additional quantity of milk. At the first introduction of the improved breed, the prejudice against them on this account was very great, and certain experiment were made, by the result of which it was made to appear that the milk of the Kyloe cow yielded double the quantity of butter that could be produced from that of the improved short-horn. Two ounces were obtained from the milk of the Kyloe, and one from that of the short-horn.

This aroused the advocates of the new breed, and they instituted their experiments, the result of which was much less to the disadvantage of the short-horns. Mr. Bailly gives an account of an experiment made by Mr. Walton, of Middleton. He took from his dairy six cows promiscuously, and obtained the following quantity of butter from a quart of the milk of each of them.

		oz.	*dwts.*
No. 1	- - -	3	6
2	- - -	1	6
3	- - -	1	12
4	- - -	1	10
5	- - -	1	14
6	- - -	1	6

10 8, which divided by 6, leaves nearly 1 oz. 14¾ dwts., or about seven-eighths of the weight of butter from the same quantity of milk. Then, the increased quantity of milk yielded by the short-horn gave her decidedly the preference, so far as the simple produce was concerned.

This experiment brought to light another good quality in the improved short-horn, which, if not altogether unsuspected, was not sufficiently acted upon—that she improved as a dairy cow as she got older. The cow, a quart of whose milk produced more than 3 oz. of butter, was six years old; the other five were only two years old; at all events, the experiment proved that her milk was richer at six years old, than it had been at two. This is a subject which deserves investigation.

Another circumstance is somewhat connected with such an inquiry. The Kyloe and the long-horn cattle seem to care little about change of situation and pasture; but the short-horn is not so easily reconciled to a change; and her milk is not at first either so abundant or so good as it afterwards becomes.

A prejudice likewise existed, and perhaps does yet in the minds of some dairymen, against the large improved short-horns. The breed generally are great consumers; and it was also supposed that, in proportion to the condition of the cow, she was likely to run to flesh instead of yielding milk, and therefore a rather small cow was selected, and one that did not carry about her many proofs of point.

That there is a great difference in the quantity of food consumed by different breeds of cattle, cannot be doubted; and that the short-horns occupy the highest rank among the consumers of food is evident enough; but we never could be persuaded that the difference of size in the same breed made any material difference in the appetite, or the food consumed. When they stand side by side in the stall or the cow-house, and experience has taught us the proper average quantity of food, the little one eats her share, and the larger one seldom eats more, even when it is put before her. There are occasional differences in the consumption of food by different animals, but these arise far oftener from constitution, or from some unknown cause, than from difference of size. Experience does, however, prove beyond the possibility of doubt that the larger cattle, the breed and other circumstances being the same, yield the greatest quantity of milk.

Experience has also proved another thing—that the good grazing points of a cow, and even her being in fair store condition, do not necessarily interfere with her milking qualities. They prove that she has the disposition to fatten about her, but which will not be called into injurious exercise until, in the natural process of time, or designedly by us, she is dried. She will yield nearly as much milk as her unthrifty neighbor, and milk of a superior quality, and at four, five, or six years old, might be pitted against any Kyloe, while we have the pledge that it will cost us little to prepare her for the butcher, when we have done with her as a milker. It is on this principle that many of the London dairymen now act, when they change their cows so frequently as they do; but whether this, even allowing the rapidity with which the beasts fatten, is the best and most profitable mode of management, will be the subject of future inquiry.

Some time after Mr. Walton's experiment, the following observations were made by Mr. Calvert, of Sandysike, near Brampton, on the quantity of butter yielded by one of his improved short-horns. The milk was kept and churned separately from that of the other stock, and the following is the account of the number of pounds of butter obtained in each week: 7, 10, 10, 12, 17, 13, 13, 13, 15, 16, 15, 12, 13, 13, 13, 14, 14, 13, 12, 12, 13, 11, 12, 10, 10, 8, 10, 9, 10, 7, 7, 7.

From this it appears that there were churned 373 pounds of butter in the space of 32 weeks. The cow gave 28 quarts of milk per day, about Midsummer, and would average nearly 20 quarts per day for 20 weeks. She gave more milk when she was depastured in the summer than when she was soiled in the house, in consequence of the very hot weather. She was lame during six weeks, from "foul in the feet," which lessened the quantity of milk during that time; and the experiment was discontinued, because there was not a sufficient supply of turnips, and the milk of the whole of the herd was rapidly diminishing. For the first fortnight after calving, she was allowed a little broken corn; and from that period to the commencement of the turnip-season, she lived entirely on grass, with some cut clover, when it was necessary to shelter her from the inclement heat. The pasture was by no means of a superior quality.

After such a record—and it is far from being a singular one,—"there can be no doubt," to adopt the language of the reporter, "of the possibility of raising a breed of milking short-horns, which will surpass every variety of cattle in the kingdom." We may, perhaps, safely add, that we have that breed, and that it only requires a little care in the selection, and in crossing, to perpetuate it.

MEASUREMENT OF CORN-CRIBS AND GRANARIES. CLIMATE OF ITALY, AND OF THE VALLEY AND PIEDMONT OF VIRGINIA.

To the Editor of the Farmers' Register.

Rockbridge Co., June 9th, 1839.

In an early number of the Farmers' Register, you published a communication from one of your correspondents, containing an easy and convenient method of calculating the contents of a corn-crib, &c., in barrels. The method there given, will, no doubt be found very useful to all those who are accustomed to count their corn, by the barrel; but we, who live west of the Blue Ridge, are accustomed to estimate our corn, as well as our wheat, by the bushel. A rule, then, of convenient and ready application, for calculating the number of bushels contained in a corn-crib will suit us better than the one you have given. I have been in possession of such a rule more than thirty years. It is, however, not one of my own invention. I found it in some work on agriculture, I think, 'Bordley's Husbandry.' It is very similar to the rule I have alluded to for calculating by the barrel. They are both founded on exactly the same principles, I think.

The rule for finding the content of a crib, granary, &c. in bushels, is the following.

Find the content of the crib or granary in cubic feet; then multiply the cubic feet by 8, and from the product cut off one figure to the right hand; the remainder is the content in bushels.

Example. Suppose a corn-crib to be 20 feet long, 8 feet wide, and 9 feet high; by multiplying these numbers together we shall have the content in cubic feet, viz. 1440; this number multiplied by 8 will give 11520. Cut off the nought on the right hand, and the content in bushels will be 1152. If the crib be filled with corn in the ear, take one-half of the content in bushels, and the content in shelled corn will be 576.

This rule is not precisely accurate. It is founded on the supposition that a bushel contains a cubic foot and a quarter; but our statutary bushel is somewhat less than a cubic foot and a quarter. When Mr. Jefferson was secretary of state of the United States, he made an elaborate report on weights and measures, in which he recommended to congress that a cubic foot and a quarter should be adopted as the content of the bushel for the United States. No law was ever passed by congress on the subject, but if Mr. Jefferson's recommendation had been adopted, the rule I have mentioned would be precisely accurate. It approaches accuracy, however, so nearly as to answer all common purposes. The cubic foot and a quarter contains 2160 cubic inches; the statutary bushel $2150\frac{4}{10}$ cubic inches, which is $9\frac{6}{10}$ cubic inches less than Jefferson's bushel; but $9\frac{6}{10}$ cubic inches is but little more than a gill, and would make a difference of about a bushel in two hundred.

While I am on the subject of measures, I would remark that, until lately, I had never seen an arithmetic in common use, which contained a complete table of dry measure. They tell us how many gallons make a peck, and how many pecks make a bushel; but they do not tell us how many cubic inches are in a gallon. If we take the cubic inches in a wine gallon as our standard, our bushel will be too small; if we take those in a beer gallon, our bushel will be too large. Mr. Davies, the professor of mathematics at West Point, published an arithmetic a few years ago, intended for common schools, which contains a very complete table; but the work I believe has not yet come into common use, although it is certainly superior to those generally used.

The extract from Arthur Young's 'Notes on the Agriculture of Lombardy,' published in the number of the Register for last April, page 196 under the word "Omission," surprised me exceedingly. I have long been in the habit of considering the climate of Italy, especially of the northern and middle parts, as amongst the most pleasant in the world; but Mr. Young informs us that "the great complaint in Piedmont is the excessive heat in summer; equal, he was assured, to almost any that is felt on the globe, and of a suffocating quality; while the frosts in winter are as severe, in the contrary extreme." While I considered the climate of Italy, in general, so pleasant, I thought that of Florence peculiarly so. With the idea of Florence, I always associate the ideas of clear sunshine, of flowers, and of Milton's Valombrosa; but it seems it was all an illusion; for Mr. Young says—"I was at Florence in the beginning of November, and the ice was four inches thick." He tells us also that "one-fifth of all the productions of the earth are calculated to be destroyed by hail and other accidents." And again he says, "in the management of the vines in the Parmasan, there is a practice which shows the constant dread of severe frosts. All the vines are now (in November) turned down, and the end shoots buried in the earth to preserve them"—although this operation injures them. Ice four inches thick on the first of November, and vines buried to protect them from the winter frosts, indicate a severity of winter cold, very near to that of Montreal and Quebec in Canada.

I have long considered our great limestone valley, and the range of counties in Virginia immediately east of the Blue Ridge, as naturally the most desirable country in the United States. My principle objection to it was, that it was too cold in winter, and too warm in summer. But as in these respects it seems to be greatly superior to the far famed Italy, the objection must be given up.

While I think so highly of the "valley" and the Piedmont country east of the Blue Ridge, I would not disparage the tide-water region of Virginia. When you drain your marshes and mill-ponds, and your fields, and prosecute an economical and careful system of cultivation, your country will become as productive and as beautiful as the Netherlands of Europe. But I, who from my infancy, have been accustomed to hills and mountains, could not live comfortably in a plain country, out of sight of clear purling streams, verdant fields, and picturesque scenery.

One other thing in your quotations respecting northern Italy, has surprised me. From Arthur Young's description of northern Italy, it would seem to be one of the most fertile and best cultivated countries in the world; but from Professor Symonds, account published in your last May number, it seems that it is torn to fragments by mountain torrents. The devastation he describes is terrible. I have no data by which to ascertain accurately the year when Arthur Young made his tour in Italy; but I cannot be far wrong in supposing it to have been about 45 years ago. Neither do I know when Professor Symonds made his tour; but say 5 years ago, it would then seem that great change in the country (if indeed, there has been a change,) must have taken place in the short space of about 40 years. This does not argue much in favor of modern improvement, at least in that country.

From the garrulous strain of part of this communication, you will readily believe that the writer chose a proper signature, when he adopted that of SENEX.

P. S. Our wheat, rye and oats, in that part of the valley in which I live, promise a most abundant crop. In some parts of the valley I have understood they are not so good. Much rain, however, would spoil our fair prospects. The timothy in our meadows, this season, has almost all turned to cheat; but as you will, probably, not like this phraseology, it being contrary to your theory, I will say that our meadows, which formerly produced timothy, this season produce cheat. This will be a serious draw-back on our farmers, as cheat is a very worthless crop. Clover is very scarce, so that our horses must depend, the ensuing year, chiefly on grain feeding. S.

[The article by Professor Symonds is much older than our correspondent supposed. It was first published in 1784. Young's tour in Lombardy was made in 1789.—ED. FAR. REG.]

COUNTER ESTIMATES, AND OBJECTIONS TO THE ALLEGED PROFITS OF MULBERRY CULTURE. NEW OBSTACLES TO THE TROPICAL PLANT, SCHEME AND OPERATIONS.

Translations of extracts from two letters written in Spanish by myself to Sr. Don M. Margalli, ex-governor of Tobasco, and dated at the Consulate A. Campeachy, 3rd and 5th March, 1836.

"I conclude this sketch of the morus multicaulis by adding some data derived from many experiments. 1. The quantity of leaves which may be produced by one mecate[*] of mulberry trees can be estimated at an average weight of ten quintals.[†] Some cultivators say 8, others 9, others 13 quintals; and some even estimate the produce as high as from 13½ to 27 quintals the mecate: but it should be observed that they speak of periods differing from the 5th to the 20th year of the plantation. I have extracted these proportions from the measures of French hectares and English acres; and hence I have arrived at the resulting inference, that without exaggeration one may extract from trees in the third year at the rate of 10 quintals of leaves from each mecate in each crop, *i. e.* 20 quintals of leaves from one mecate in one year. 2. The quantity of cocoons that may be obtained from one quintal of leaves, I place at the medium of six pounds and a half of cocoons. Some persons have obtained 5 to 5¼ and 5¾ pounds, and others 7¼ to 7½ lbs. cocoons to each quintal of leaves; but as the smaller quantities were obtained from the leaves of the white mulberry, I believe the proportion of 6½ pounds of cocoons to one quintal of leaves to be very moderate. 3. The quantity of leaves consumed by one ounce of eggs may average twenty quintals. The cultivators vary much in their estimates of the quantity of leaves consumed by the worms which are born from one ounce of eggs, the number of which exceeds 50,000 worms; but we should consider that the most experiments were made with the leaves of the white mulberry. The following numbers indicate the different results: 10½ qqls., 11 qqls. 88 lbs; 13 qqls. 20 lbs., 16 qqls., 19 qqls., 20 qqls., and even 25 quintals of leaves, for one ounce of eggs. In view of these experiments I believe myself sufficiently liberal in conceding 20 qqls. of leaves for one ounce of eggs. 4. The quantity of cocoons produced by one ounce of eggs must consequently vary in proportion to the quantity of leaves consumed, and according to my estimate of 6½ lb. for 1 qql.×20=130 pounds of cocoons from 1 oz. of eggs. The results of experiments have varied from 50 to 60, 70, 92⅔, 97⅓, 116. 121, 123½, 140, and even 165 pounds cocoons to 1 oz. eggs. 5. The medium quantity of net silk from 1 lb. of cocoons may be estimated at one-tenth, or 1 lb. silk to 10 lb. cocoons.

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[*] One mecate equal one-tenth of an acre.

[†] One quintal equal 100 pounds.

Recapitulation.

1st fact. 1 mecate of mulberries yields 10 qqls. leaves each crop, or 20 quintals on the two crops for one year.

2nd. 1 quintal of leaves gives 6½ pounds of cocoons, which equals 130 lb. for two crops from one mecate one year.

3. 1 ounce of eggs consumes 20 qqls. of leaves, or produce of one mecate for one year, equal half ounce eggs for one crop of 10 quintals.

4. 1 ounce of eggs will yield 130 pounds of cocoons from one mecate, as noted in fact 2nd.

5. 1 pound of cocoons yields one-tenth silk; *i. e.* 13 lb. silk from one mecate in two crops in one year.

And hence 5 mecates=100 quintals leaves=650 lb. cocoons=65 lb. net silk, at $5=325 dollars, one year. Giving to the cultivator 75 dollars for the leaves, calculated at 4 francs the quintal; to the raiser 107 dollars 6½ shillings net for the cocoons, or $182 6½ gross, at 1½ francs the pound; to the reeler 142 dollars 1½ shillings net for the silks, or $325.

Hence—one mecate yields to the cultivator in leaves, in two crops, valued at 75 cts. the 100 lb. - - - - - - $15 00
To the rearer of 130 lb. cocoons from those 2000 lb. leaves, gross $36 56¼ cents, at 28⅛ cts., or net - - - 21 56¼
To the reeler of 13 lb. of silk from those 130 lb. cocoons, gross 65 dollars, at $5 or net - - - - - - - 28 43¾

But admitting that from each quintal of leaves there should be obtained solely the minimum of 5 pounds of cocoons, and that both the leaves and the cocoons should be sold in Yucatan at 33⅓ per cent. less than their price in France, or what is the same that the French should sell their leaves and cocoons at 50 per cent. more than the people of Yucatan; nevertheless, the business will still be more profitable than any other cultivation in this peninsula. At 50 cts. the 100 lb. leaves, and at 18¾ cts. for 1 lb. cocoons, one mecate yields 10 dollars a year to the cultivator of the *leaves*; and $24 37½ gross, or $14 37½ net to the rearer of the cocoons; and at $3 33⅓ cts. for 1 lb. silk, it yields $43 33⅓ gross, or $18 96 net to the reeler. That is, $10 leaves+14 37½ net cocoons+18 96 net silk=$43 33⅓ cents.

HENRY PERRINE."

Note by H. P. at Indian Key, 25th April, 1839.

The last estimates proportioned to an English acre will be ten times the number and value. That is, one acre should yield in *two* crops 20,000 pounds of *leaves*, at half a cent a pound=$100; of *cocoons* 1300 pounds at 18¾ cents a pound=$213 75 cts. gross, or $143 75 cts. net; of *silk* 130 pounds, at $3 33½=$433 33⅓ cts. gross, or $189 60 cts. net.

For *one* crop, *leaves* from one acre, *gross* $50; cocoons $121 87½; silk $216 66.

To the Editor of the Farmers' Register.

Indian Key. Tropical, Florida,
25th April, 1839.

Sir—Having attentively examined the estimate of the value of the mulberry and silk-culture, by Dr. Wm. Gibbons, of Delaware, published in your February No., on the 85–6 pages; and, "as doctors will disagree," believing that all similar "estimates," however well calculated to promote the sale of mulberry cuttings, will prove injurious to the culture of silk-worms, I send you a counter estimate, based on the quantity of leaves that may *commonly* be raised by ordinary cultivation on ordinary soils. So far as I can understand your opinions, I believe they agree perfectly with mine in the following positions. 1st, That the national importance of the combined propagation of the mulberry and production of silk is not to be estimated by the hypothesis that this branch of industry will yield *more profit* than an equal amount of labor and capital employed in the culture of corn or of cotton. 2nd, That the great national advantages of this new branch of industry will result from the facts that it will as *profitably* employ those poor soils and feeble persons that cannot be profitably dedicated to the culture of corn or cotton, or any of our old staples of agriculture. 3. That as a small surface of the poorest soils cultivated by the poorest man will yield leaves enough for the feeblest persons in health, sex or age, of the largest family to feed unto worms and to reel into silk, the great national result will be to cover our hitherto worthless soils with a dense population of small cultivators, and of family manufacturers.

In relation to the profit of raising mulberry leaves alone, I long since, even in the tropical climate of Yucatan, made the following *estimate*, viz: that the intrinsic value of mulberry leaves for *food for silk-worms* is about equal to their intrinsic value for fodder for milk cows!! As a collateral conclusion, I add that the desideratum is not merely to get the species of mulberry which will yield the greatest weight of leaves to the surface of a single acre of the poorest lands, but also that which will yield the greatest weight of leaves to the labor of a single hour, or single hand. Indeed, for the steril islands of Tropical Florida, I appreciate the value of the morus multicaulis more highly as fodder for cows, to convert into milk, than as food for worms to convert into silk; yet for either purpose I should not estimate the value of its cuttings at half a cent, or one-eighth of the estimate of Dr. Gibbons, although here the trees will yield at least *two crops* a year.

Counter estimate of the value of the morus multicaulis for silk-culture.

1. One acre of the poorest soil, with common culture, may commonly yield 5000 lb. leaves per acre.

2. Two hundred pounds of leaves with common management may commonly yield 1 lb. silk.

3. Hence one acre of the poorest soils, with common labor and common success, may yield 25 lb. silk.

4. Twenty-five pounds of silk might commonly be reeled from 250 lb. cocoons, of 400 to each pound.

5. The relative value of leaves is estimated at one-fourth the quantity of cocoons.

6. The relative value of picking and transporting the leaves at one-fourth ditto.

Hence—

1st. One pound of ordinary raw silk, as commonly reeled, may bear the average price of $3.

2. The ten pounds of cocoons from which the silk would be reeled, at 20 cts. per lb., equal $2.

3. The two hundred pounds of leaves eaten to make those cocoons, at one-fourth [the value of the cocoons,] or ¼ cent per lb.=50 cents.

4. The picking and transportation of said 200 lb. leaves to the cocoonery, at one-fourth=50 cts.

Thus for one cent—

1. The cultivator must raise 4 lb. of leaves; and the picker must transport them for one cent.

2. The feeder must rear 40 worms into cocoons; and the reeler must unwind them for one cent. Now if the farmer can get but 25 cts. the 100 lb. for leaves on the trees, or 50 cts. when carried to market, he will obtain for 5000 lb. but 12½ dollars per *acre* in the field, or $25 at the cocoonery. And what farmer would consent for this result to give even half a cent each for 1200 cuttings, or $60 the acre?

Charles Howe, esq. of this islet, who has been propagating the morus multicaulis on this barren rock during upwards of two years past, has been forced, by the removal of his fence, to avail himself of an accidental rain at the season, in setting out the cuttings of the trees which would otherwise have been left outside of his enclosure, is now multiplying them for the express purpose of affording fodder for his cows during the dry season, when the common grass herbage is withered or dead. He obtained them at first under the common delusive impressions of the great profits to be derived from the silk culture; and indeed if there be any profits at all, north of Florida, he was certainly warranted in the inference that he could make at the least double profits, by the fact that in Tropical Florida the trees will yield, at the very least, double the weight of foliage every year. And hence, at all events, whether as fodder for cows or feed for worms, if the leaves can be raised in the middle states at any profit, they can be raised here at one hundred per cent. more. As during the last eight years, I have almost constantly used a *manifold writer*, I am enabled to transmit you the copy of some estimates made by me at Campeachy, in March, 1836, in order to stimulate the indolent Mexicans to engage in the combined propagation of the mulberry and the culture of silk. You will perceive by the data contained in that article that I was misled into the error of admitting ten thousand pounds of leaves to one crop from one acre, which is just 100 per cent. more than I am now willing to admit will be commonly obtained, by common culture, from one acre of the poorest soils. Judging, however, by the variant estimates of those writers who wish to encourage the sales of mulberry trees at high prices, one hundred per cent. is a very trivial mistake! In the table of probable produce per acre, given by E. Roberts, from 16 different persons, we find the number of pounds of silk varying from 18 to 27, and 61 lbs. in the lowest, to 333, to 666, and even 1296 lbs. in the highest; and hence the estimate of the leaves per acre multiplied by 200 lb. leaves for 1 lb. silk, must vary from 3600 lbs. to 259,200 lbs. of leaves to the acre!! or 7200 per cent!!! Mr. Roberts very gravely remarks that some of these are quite too high!! and then very gravely sums up, the total, divides by 16, and assumes that 249 $\frac{5}{16}$ lbs. at $4 per lb. or $1000 per acre, may safely be put down as the average profits!!! This mode of ascertaining profits reminds me of the mode of ascertaining damages practised by a frontier jury in Illinois, when I resided there many years ago. Each juror chalked down his individual estimate of the damages in a suit for assault, the lowest being one cent and the highest 500 dollars, the aggregate of 600 was divided by 12, and the verdict brought in for 50 dollars! But seriously, these extravagantly discordant estimates will injure the progress of legitimate silk-culture in the United States. I have seen the weight of leaves requisite for one ounce of eggs vary from 1050 to 2500 lbs. in estimates; the weight of cocoons from one ounce of eggs vary from 50 to 165 lbs.; the weight of cocoons from 100 lbs. leaves from 3⅗ lbs. to 7¾ lbs.; the weight of cocoons for 1 lb. silk, from 8 to 13 lbs.; the number of cocoons for 1 lb. silk from 2000 to 6000!! What the public wants are positive facts from the *bona fide* silk-culturists themselves. When a series of poor men on the poorest soils shall credibly testify that their ordinary crops of leaves, with ordinary culture, have exceeded 5000 lbs. leaves per acre, I shall believe the facts, but not till then. With these moderate opinions of the value of the silk culture, I nevertheless estimate its national importance on a much higher scale than those who attempt to seduce the public by the specious prospect of speedier and greater profits than are obtained from our old staples of agriculture.

I was the first person that introduced the morus multicaulis, not only in Tropical Florida, but into any part of East Florida. By the 'Silk Culturist' of July, 1836, p. 123, I perceive that under the date of St. Augustine, June, 1836, a Mr. D. Brown, claims that honor by saying, "In November, of '33 I arrived in St. Augustine with fifty small plants of the morus multicaulis, obtained from Mrs. Parmentier. They were the first ever brought to Florida."

Now the facts are, that the same worthy lady, under date of the 5th April, 1833, shipped for me twelve trees of morus multicaulis in the schr. Olynthus, Capt. Trowbridge, care of T. A. Browne, Key West, by whom they were forwarded (or rather backwarded) north-eastwardly say 150 miles to John Dubose, inspector at Cape Florida, where they arrived on the 20th May, 1833.

I take this occasion to acknowledge publicly that the patriotic Madame Parmentier not only sent for me at the same time to Cape Florida a fine assortment of valuable plants, but that she refused to accept any pecuniary compensation for even the morus multicaulis. To this highly enlightened woman, and to her exceedingly intelligent daughter, was Professor Ramen de la Sagra, of the botanical garden at Havana, indebted for the first tree of morus multicaulis and for the first eggs, in the fall of 1832, with which he made the first essays on the propagation of the plant and the culture of silk in the island of Cuba, which resulted in the conviction that there, as in Guadaloupe, *ten* crops of cocoons can be raised every year; and if so in tropical Cuba, ten crops *can* be annually raised in tropical Florida. By the by, my family are now engaged in experimenting with four or five varieties of silk-worms, some of which are now spinning their cocoons; and as they keep an accurate record, the copy shall be at your service.

If John Dubose had possessed the knowledge and disposition requisite to propagate those twelve trees of morus multicaulis, received by him on the 20th May, 1833, their progeny on this 25th April, 1839, might have been multiplied into many millions of trees. But I have the great regret to say that whatever may have been their artificial or spontaneous propagation in the vicinity of Cape Florida, their number has been *diminishing*, by dishonorable means, since their speculative value has become known; as it seems that even an officer of the United States thinks that he has as good a right to them as the Indians.

To show how the power of our departments to do great good may be perverted to do great evil, by their distant and inferior agents, I will give a single example. In July of last year, Col. Downing, the delegate from Florida, requested Mr. Poinsett to give me a special letter of instructions to the commander of the schooner Wave to render me any aid which would not interfere with his particular duties to the department. The Hon. Secretary of War, moreover, spontaneously proffered me a *general circular* to the same effect, directed to all the officers and agents of the war department in and near the territory of Florida.

As during the Indian warfare on the main land the trustees of the Tropical Plant Company could not do any thing more useful than to establish on the most eligible Key a preparatory nursery for all valuable plants which can be profitably propagated in the most arid soils, and hence especially important for all these steril islands, we selected and improved on lower Matacumba, the site immediately adjoining the watering pits for all the vessels along this reef; and hence *the only aid under the instructions* of Mr. Poinsett solicited by myself, was simply to obtain, in the vicinity of Cape Florida, the remaining progeny of my few tropical plants, and transport them to said nursery, *where all vessels must necessarily come for water.* The U. S. Sloop Panther, Lieut. Shubrick, and the U. S. Revenue Cutter, Lieut. Coste, both under the control of the commander of the U. S. Wave, (which was *rarely* and *briefly* here,) were frequently cruising between Cape Florida and Indian Key during the winter, and both lieutenants readily promised this trifling assistance. After the return of Lieut. Shubrick from his ordinary cruise to the Cape, he informed me that he could not find a *single plant* such as I described, although I had given him the printed documents and especial directions; but his *pilot* accidentally confessed that he had *pulled up some large leaved mulberries* in the garden of Mr. Dubose on the Miami river, and *transplanted them* in *Soldier's Key*, some miles south of the light house on Key Bizeaine!! Lieut. Coste of the Revenue Cutter, then professed his willingness to remedy the defaults of the transport sloop; but instead of transferring my plants to the preparatory nursery on lower Malacumba, *he has actually continued to transplant them in his own enclosure on the opposite islet of Tea-Table Key*. Be it understood that Lieut. Coste occupies and claims this Key as his own, from the fact, that since September last, he has been clearing it, improving it, and building on it, *with govermental means* of men and materials; that he is thus converting said Tea-Table Key into a *town-site* for a rival port of Indian Key, under the apparent patronage of the inimical proprietors and public officers of Key West; and that hence, *not* content with speculating in *town lots*, he is determined to speculate also in *tropical plants*, by the *abuse* of the same govermental means. The detriment to the preparatory nursery, and consequently to the public progress of agriculture on this reef, will be infinitely greater than the individual benefit which can result to Lieut. Coste himself; as his confessed ignorance of the nature or culture of plants will be the cause of the destruction of most valuable species which might otherwise be multipled on lower Matacumba, both for a nursery of abundant supply, and a model of *successful culture*. You should be aware that such is the state of the limited society on this wrecking reef, that no injury can be easily prevented or redressed by due course of law; and, as I have learned, by a long course of painful experience, that it is less troublesome to endeavor to forgive injuries than it is to attempt to punish them, I simply relieve my feelings by thus exposing the facts to the agricultural community, who can sympathize with me for these outrageous obstacles to the progress of my great enterprise. Besides, were I even inclined to make formal charges against Lieut. Coste, to the proper department, I would not make them now, because I am persuaded that he will avoid the punishment of removal from office on the prior charges of speculating in town sites, and receive the reward of an appointment to office under the collector of Key West, say an inspectorship, which will enable him to continue at Tea-Table Key, and thus more effectually subserve the hostility of the monopolizing proprietors of Key West against the monopolizing proprietor of Indian Key. I never had, and never shall have, any personal interest in any of the rival islets of Florida; the Tropical Plant Company never shall have any connection with the rival proprietors, as partizans of interests of any Key in the Florida Reef; and as soon as the Seminoles may permit, I shall remove my family to some spot between Cape Sable and Cape Florida, to which a wrecking vessel cannot possibly come, and where even a wrecker's voice cannot possibly be heard. As Key West, by being a port of entry, has long enjoyed the whole monopoly of the wrecking business on this reef, and as an additional port of entry would at the least divide the monopoly, the fact that memorials have been presented to congress in favor of Indian Key, and that it is at least very near the central position, or wrecking rendezvous, where the new port of entry must necessarily be made, furnish sufficient explanations of the hostilities of the proprietors and officers of Key West, not only to Indian Key itself but also to every site and enterprise in its vicinity, which may not be directly prejudicial to the prosperity of Indian Key. Hence you perceive that the evils of the public vessels cruising on these coasts; for while Lieut. Shubrick of the U. S. Sloop Panther became the temporary partizan of Indian Key, Lieut. Coste of the Revenue Schooner Campbell, has become the permanent partizan of Key West. The result of the whole to the nursery will be: 1st. As all regular mails are suspended, it will be impossible to procure any plants from the green houses of the states, or of Europe. 2nd. As the instructions of the Secretary of War will continue to be perverted, there will not be obtained any plants from even the vicinity of Cape Florida. 3rd. That as even the express instructions of the Secretary of the Treasury would as likely be perverted, we shall not be able to obtain from the steril Bahama island those valuable plants which will be equally valuable to these steril Florida Keys, as the collecter at Key West can easily avoid the employment of the waste time of a revenue cutter in that service to the public, and can as easily prevent a private vessel from being chartered for that purpose, by refusing her permission to transport the living plants *direct* into the nursery at the only proper season, the beginning of the rains in June next. 4. That hence for a whole year we shall have no plants to mutiply in the nursery, except those planted in boxes in 1837, in this islet, which have survived exposure to the gale; and that it will continue equally isolated from all facilities of communication and transportation for many years, unless public opinion shall compel the restoration of a regular mail, the establishment of a new port of entry, or the direct employment of public vessels in the importation of plants under the treasury and navy circular of Sept. 6th, 1837. HENRY PERRINE.

REMARKS BY THE EDITOR. COMPARISON OF ESTIMATES.

Fearing that our readers had been surfeited with articles on the morus multicaulis, and especially those who had not been affected by the "mulberry fever," we had latterly endeavored to avoid subject. But the little zeal that now exists among agriculturists seems to have all taken this direction; and they either think and write about silk-culture and morus multicaulis, or not at all, at least for the benefit of the public. But the foregoing communication is from one in the *singular* attitude of *an opponent;* and therefore his views ought to be welcome to all among our readers who may disbelieve in the fitness of our country for silk-culture; and those of the contrary opinion may well agree that an opponent shall have full scope for his argument, and a respectful hearing.

Dr. Perrine has not mistaken our views, when he supposes that we concur, in the main, in the general propositions which he states, and which place the products and profits of silk-culture upon a footing of *something like equality* with those of other and ordinary agricultural pursuits; and we even more fully concur with him in withholding all confidence from, and awarding nothing but contempt to, the extravagant estimates of prospective profits, which have been published either through ignorance, or the desire to mislead and delude the credulous public. But, it must also be admitted, even if writers have the strongest desire to learn and to state the truth, that it is very difficult to prepare estimates of the cost and profits of a culture so new, and of which so little is known any where, without there being considerable errors made, and great discordance between the same items, as set down by different calculators. Therefore we are distrustful of all estimates, not founded on practical results; and no less so of our own ability to correct what we may consider as erroneous premises. For this reason, although believing Dr. Perrine's estimetes of products and profits to be generally too low, we shall offer corrections with the diffidence which ought to attend ignorance; and shall not presume to substitute any arithmetical statements as absolutely correct, and entirely unimpeachable. With this salvo, then, afforded by the confessed want of practical knowledge, and of full and correct information in regard to silk-culture—and after having admitted our concurrence in our correspondent's general propositions—we shall proceed to state our dissent from some particular items and premises, from which he deduces his objections.

Dr. Perrine supposes that 200 lbs. of leaves will be required to produce 1 lb. of cocoons. But Dandolo, whose authority is beyond question in all points which, like this, could be tested strictly by experiment, allows 1609 lbs. of leaves, "as gathered from the tree," to produce 120 lb. of cocoons, and which ought to be obtained from 1 oz. of eggs. This would give 15 lb. of cocoons instead of 10 lb. from 200 lb. of leaves—a difference of 50 per cent. in gross product, in this our item alone, and which might be equal to a difference of 200 per cent. in the net profit of the two rates of product.

Dr. Perrine's estimate of the quantity of cocoons required to produce 1 lb. of silk, is 10 lb. But Young states of several places in Italy that 8 lb. of cocoons made 1 lb. of silk; and this was the usual rate at Padua, where the general management must have been very bad, as 30 lb. of cocoons only were obtained from 1 oz. of eggs. (See Far. Reg. p. 275. vol vii.) In the more full and particular estimates made by Sig. Modena, of his operations in 1778 and 1780, in the one year it took only 6 lb. of cocoons, and in the other 7½ lb. to make a pound of good silk, besides all the inferior, (or refuse,) which was very considerable in amount. These are such unusual products, that they may well be distrusted, although stated with great appearance of accuracy. (See F. R. p. 274, 5, vol. vii.) It has been ascertained in this country, even north of Virginia, that 8 lb. of good cocoons will make a pound of silk. The difference, then, between 8 and 10 lb. of cocoons being required to make the same amount of silk is of itself more than 20 per cent. added to the gross product (and perhaps 50 per cent. to the net product) of the culturist who reaches the highest of the two grades of product.

The price stated for raw silk ($3 the pound,) is much too low for the European, of good quality, at this time; and it is understood that American silk has recently been tested in Europe, and is admitted by competent judges to be worth more than the European by $1 in the pound. The market value therefore may be computed at nearly double the sum supposed by Dr. Perrine—which of course, shows another very large percentage to be added to the net profit of the culture.

The valuation of mulberry leaves, (25 cents the 100 lb. on the tree, and 50 cents, if gathered and delivered at the cocoonry,) is also much too low. M. Carrier states that for the preceding 20 years in the Cévennes, (which may therefore be supposed to be similar in demand to France in general,) the price had been 5 francs the quintal, or 93 cents the 100 lb.; and, as it may be fairly assumed, without a particular estimate, that the leaves will be worth as much for feeding worms here, as in France, if the general returns of silk-culture are here as great as there; and if greater here, the leaves of course will be worth so much the more.

In making the foregoing corrections we have abstained from referring to any doubtful authority, or using any of the abundant, available and recent testimony, which might possibly be suspected of being influenced by the mulberry speculaton, or any other bias of self-interest, or of delusion. It is therefore that we have appealed principally to authorities so remote, in point of time or of position, as to be free from all such objection.

It may be objected to these corrections of Dr. Perren's premises, that he speaks of "common management," and that it might, and probably would, require *good management* to obtain the above products from the silk-worms. Admitted; but it should be also considered, that "common management" in Europe is decidedly "bad management;" and that *bad* management, in this business, is always more costly and less profitable than *good* management. In most cases of "common management," it is computed that half the worms perish by disease, or yield little or nothing. In Virginia, even upon first trials, and in ignorant hands, it is clearly seen that 5 per cent would be an unusual and unnecessary loss..

Though uninformed as to the product of leaves from any particular quality of land, whether the best, the middling, or the worst, we are induceed to believe that Dr. Perrine has allowed *too much,* (5000 lb.,) as the product to be expected from the "poorest soils." This admission, whether properly made or not, should however exempt us *from* the charge of wishing to make the most of his estimates, for the purpose of exaggerating the profits of mulberry or silk-culture. If taking as correct Dr. Perrine's own estimate of the crop of leaves, and also his manifestly too low valuation, (25 cents the 100 pounds,) it will make the amount $12 50 per acre, annually, for the value of the leaves, as standing on the tree; and every cultivator in Virginia knows that this is a much better profit than is obtained, not only from the poorest, but from those much better than the poorest soils—perhaps from half of all the land now cultivated in grain. For, after a few years' growth, mulberry plantations will need but little tillage or other expense, and the value of two-thirds of the crops of leaves, as they stand on the trees, must be clear profit. This would be, say, $8 clear annual profit from the poorest soils. Deduct one-half the crop, for supposed over-estimate, and still there would be $4 a year, per acre of clear profit. This product alone, contemptible as Dr. Perrine may consider it, if derived from all the "poorest soils" in the southern states, and which now yield no clear profit whatever, would be an immensely profitable change from the present state of things, both to the individual proprietors, and to public interests.

If then we should take Dr. Perrine's estimates without abatement or correction, they will go to prove the great profits which invite all southern cultivators to mulberry and silk-culture; and the deduction is so much the more valuable, as coming from facts and reasoning designed to show different results. And if the proper corrections be made in the three items—of product of cocoons from a certain quantity of leaves, of silk from the cocoons, and of the price of the silk—then the whole amount of profit will be much higher. It will then not appear so strange that, taken in either way, we consider Dr. Perrine's estimates as decidedly in support of the position that silk-culture must be highly profitable.

But we are not arguing for victory, but to arrive at truth; and we readily admit that all arithmetical estimates of expense and profits, built upon doubtful premises, (as they must be on a subject so little understood as this,) ought to be received with much caution, if not distrust. We would discard all such grounds of estimate, as too uncertain to be confided in, and take different steps to reach our conclusion that silk-culture in this country will be sufficiently profitable, compared to other crops, to each individual undertaker, and of immense advantage to general interests. We base this opinion on the following sure grounds:

1st. Silk-culture in Italy and the south of France is generally conducted ignorantly and badly; and yet, on the whole, is in those origins a highly profitable culture. 2nd. Whatever products and profits are obtained there, might be as well obtained here, with no better management, and if the climates were alike. But our climate is undoubtedly and greatly better for silk-culture; and therefore better products may be counted on, from like management—and much better from proper management. 3rd. Even if a single acre of land in mulberry trees, for feeding silk-worms, should yield but as much profit as the same acre if in corn or other grain, still the change of part of every farm, from ordinary crops to the new product of silk, would serve to increase the profits of all the old diminished cultures, as well as to give the profit on the new. And the general and national benefitt from such change would be far greater than the mere sum of the pecuniary gain of all the individual cultivators. 4th. That besides the benefit of the change of culture, many thousands of acres of soils too poor for grain-culture would be put under mulberry culture; and other thousands of acres, which, though not poor, are either too hilly, too stony, too calcareous, or otherwise unfit for tillage.

On these grounds, together with the peculiar fitness of our circumstances, and superiority of our climate, (which we have formerly and fully treated of,) we are content to rest our claim of good and sufficient, though not very excessive profits of silk-culture in this country. Upon these grounds we rest our confidence, and shall direct our own private labors and operations, in silk-culture. These relative or comparative grounds cannot well be shaken, even if some of Dr. Perrine's allowances should prove to be too liberal, and the ordinary extravagant estimates should be made, as they deserve to be, the subject of universal derision and contempt.

AN ACT TO INCORPORATE THE TROPICAL PLANT COMPANY OF FLORIDA.

Section 1. Be it enacted by the Governor and Legislative Council of the Territory of Florida, that Henry Perrine, James Webb, and Charles Howe, and such other persons as shall become owners and holders of stock in said company, be, and they are hereby constituted and made a body corporate, by the title of the "Tropical Plant Company of Florida."

Sec. 2. Be it further enacted, that the capital stock of the said company shall be fifty thousand dollars, to be divided into one thousand shares of fifty dollars each, and in case the trustees shall hereafter find it expedient to increase the said capital, they are hereby authorized to do so from time to time, to any amount not exceeding in the aggregate one hundred thousand dollars, and to increase the number of shares in proportion to said increase of capital.

Sec. 3. Be it further enacted, that the company hereby incorporated shall be capable of holding such lands and hereditaments as they may acquire from the government of the United States, or from individuals, for the purpose of carrying into effect the objects contemplated by this act.

Sec. 4. Be it further enacted, that the said company and their successors, by their corporate name, shall be capable of sueing and of being sued, pleading and being impleaded, defending and being defended, answering and being answered in all courts and judicatures whatsoever and whatsoever, and also of contracting and being contracted with, and of purchasing and selling real or personal property, when necessary for the efficient prosecution of the business of said company, and shall have a common seal, which the said incorporators may alter, destroy and renew at pleasure.

Sec. 5. Be it further enacted, that books of subscription to the capital stock of said company, shall be opened under the direction of the trustees herein after named, or a majority of them, under the superintendence and direction of such person or persons, as they, or a majority of them shall designate and appoint at Tallahassee, Pensacola, St. Augustine and Key West, in the territory of Florida, and at Charleston in the state of South Carolina, and at New Orleans in the state of Louisiana, at such times as to them shall seem fit, which books shall be kept open for the space of ten days, or longer, if said trustees shall deem it necessary.

Sec. 6. Be it further enacted, that six hundred of the shares of said capital stock may be subscribed for and taken in the territory of Florida, two hundred in New Orleans, and two hundred in Charleston; but if any of said shares shall remain unsubscribed for at the time of closing said books at the several places herein designated, then and in that case, the said trustees may open books of subscription at such other places as they may think proper, either in said territory, or elsewhere, and the said remaining shares, unsubscribed for as aforesaid, may be subscribed for and taken by any person, whether a previous stockholder in said company or not; it shall be the duty of said trustees to require a payment of ten dollars on each share at the time the same is subscribed for, fifteen dollars in one year after said company shall have been organized, and the remaining twenty-five dollars in two years from its organization; and if any stockholder in said company, shall fail to make either of the two last mentioned payments, at the times specified, and for three months thereafter, he shall forfeit for the use of said company, his said stock, and all payments made thereon.

Sec. 7. Be it further enacted, that the capital stock, property and affairs of said company, shall be managed by three trustees to be annually chosen by the said stockholders, after the whole amount of the capital stock shall have been paid in as aforesaid, and that the first election for said trustees shall be held at such time and place as a majorty of said trustees shall by publication for one month in some newspaper published in said territory direct, within three months after the said capital stock shall have been paid in as aforesaid.

Sec. 8. Be it further enacted, that Henry Perrine, James Webb and Charles Howe, shall be the trustees from the date of this act until the time appointed for said first election and until others are elected, and all elections shall be holden under the inspection of two managers to be appointed by the trustees for the time being, and shall be by ballot, and a plurality of the votes given at such election shall constitute a choise; but all absent stockholders shall be allowed to vote by proxy, and for each share shall be entitled to one vote.

Sec. 9. Be it further enacted, that no person shall be elected a trustee of said company, unless he be at the time, a resident in the territory of Florida, and the owner of at least twenty shares of the capital stock of the same; and if at any time after the election of any trustee as aforesaid he shall cease to be a resident of said territory, or the owner of twenty shares of the said stock, his situation as trustee shall be considered as vacant, and another trustee shall be appointed in the manner hereinafter pointed out.

Sec. 10. Be it further enacted, that if from any cause an election of the trustees shall not be made at such time or times as is provided for by this act, the said corporation shall not for that cause be dissolved, but it shall and may be lawful, to hold and make an election of trustees, at such other times as the by-laws and ordinances of said corporation shall prescribe, and in case any vacancy should occur in said board of trustees, by death, resignation, or otherwise, the remaining trustees are hereby authorized, by appointment to fill such vacancy, and the person so appointed, shall hold his office until the next election in the same manner, and shall possess all the powers and authority, which he would have been invested with, had he been duly elected by the stockholders.

Sec. 11. Be it further enacted, that trustees for the time being, or a majority of them, shall form a quorum for the transaction of all business of the company, one of whom shall be selected by the others, as president of the board of trustees, and they shall have power to make all such by-laws, rules and ordinances, as to them shall appear needful and proper, touching the management and disposition of the property, estate, and effects of the said corporation, and all such matters as appertain to the concerns of the association; but all such by-laws, rules, and ordinances, made as aforesaid, may be reviewed by the stockholders of said company, and upon the concurrence of two-thirds thereof, shall be rescinded, and no bylaw of said company, which is repugnant to the laws, of this territory or the laws and constitution of the United States, shall have any force or effect whatsoever.

Sec. 12. Be it further enacted, that the stock of said company shall be assignable, and transferable, according to the rules which may be established by said trustees, but no stockhoder indebted to said company, shall be permitted to make a transfer of his stock, or receive a dividend, until such debt be paid to the satisfaction of the trustees.

Sec. 13. Be it further enacted, that the trustees shall at all times keep, or cause to be kept, at the office for transacting the business of said company, proper books in which shall be regularly entered, all the transactions of said company, which books shall be subject at all times to the inspection of the stockholders, and all trustees on going out of office, shall account to their successors, and pay over all monies of the company which remain in their hands, unappropriated.

Sec. 14. Be it further enacted, that it shall be the duty of the trustees, to call or appoint meetings, and notify the stockholders of the same, in the manner before mentioned, when required by stockholders owing one-fourth of the stock, and at all such meetings, absent stockholders may be represented to the extent of their stock, by attornies or proxies, duly constituted and appointed.

Sec. 15. Be it further enacted, that the said Henry Perrine, shall have the selection of the place deemed by him most suitable in soil and climate, for the establishment of a botanical garden and nursery for acclimating tropical plants, fruits, and flowers, provided, in making selection, he interferes with no private rights previously existing, nor with the laws and rights of the United Srates in relation to the public lands in said territory, and the said Henry Perrine, shall be the manager and superintendent of said garden and nursery, until he shall voluntarily relinquish the same, *or remove* from said territory, unless he shall be removed from the management and superintendence of the same, by a vote representing at least three-fourths of said stock; and the said Henry Perrine, shall be entitled to receive as a compensation for his services, the sum of twelve hundred dollars per annum, out of the profits accrueing from said stock, and if the said profits shall at any time amount to the sum of twelve per centum, or more on the capital invested, the said salary may be increased to any sum, not to exceed two thousand dollars per annum, at the discretion of the trustees for the time being.

Sec. 16. Be it further enacted, that if at any time, there should occur a vacancy in the office of superintendent and manager, it shall be the duty of the trustees for the time being, to appoint some other suitable person to fill said vacancy, which appointment shall be of force until the next regular election for trustees of said company, at which said election, there shall be a superintendent and manager chosen, by the holders of a majority of said stock, or their representatives; but no person shall be appointed or elected to said office, who is not the owner of at least twenty shares of said stock, and who is not a resident of said teritory.

Sec. 17. Be it further enacted, that the said trustees shall at all times, have the power and authority, to appoint all such other officers and servants as they may deem necessary for the transaction of the business of said corporation, and to displace them at pleasure, and shall allow them such compensation for their services, as they may deem right and proper.

Sec. 18. Be it further enacted, that such of the stockholders as may prefer it, shall be entitled to receive their respective dividends of profits, in any seeds, plants or other articles, cultivated in said garden by said company, in procuring the same or similar articles.

Sec. 19. Be it further enacted, that it shall be lawful for the said trustees, for the time being, to raise by lottery, in such scheme or schemes, as they may deem appropriate and advisable, a sum of money, not to exceed ten thousand dollars, which sum of money, after the payment of expenses of conducting said lottery, shall be wholly appropriated under the direction of said trustees, 1st. to the procuring and purchasing a sufficient botanical and scientific library, for the use of said company. 2d. to the procuring and purchasing the tools, implements, and machinery necessary to the conducting and carrying on the business of said company. 3d. to the paying and compensating, to such extent as the said trustees shall deem reasonable and just, the said Henry Perrine, for such exotic and other plants, as he may have already procured, and shall turn over to said company; and 4th. to the procuring from time to time, from foreign places, such other seeds and plants, as are valuable, and may be rendered valuable to said territory, by their cultivation and acclimation therein. And said lottery shall be conducted by such managers and officers as the said trustees shall appoint for that purpose; provided, that all such managers and officers shall give bond and security in such sum or sums, as said trustees shall direct, faithfully to conduct said lottery; and provided also, that said managers and officers shall not be entitled to receive for their services, a sum, which in the aggregate, will amount to more than five per centum upon the money raised by said lottery.

Sec. 20. And be it further enacted, that this charter shall last, and provisions of this act continue in force, for the term of twenty years, from the time when said company shall be organized.

Passed February 6th, 1838.—Approved Feb. 8th, 1838.

To the friends of the enterprise.

The principal objects of the company, are to form a nursery of supply and a model of cultivation of the valuable plants of the tropics.

As, however, while Indian hostilites continue, it will be impossible to pursue with safety their intended labors on the main land, of Tropical Florida, the trustees will delay the organization of the company, and will apply their personal resources to the formation of a preparatory nursery at Indian Key, and the adjacent inlets. The superintendent, Dr. Perrine, will hence reside with his family at Indian Key, until the cessation of the Seminole War, where he will continue to accumulate all the seeds, plants and other elements for the permanent nursery, to be then established on the southern coast of the Peninsula. During this important interval, the most *essential aid* to these preparatory labors may be *immediately afforded* by very *easy means* in the power of many philanthropic friends of this patriotic enterprise.

1st. By transmitting to Indian Key, at least two seeds or cuttings, &c., of every superior variety of every valuable vegetable, which the possessor may consider adapted to the climate and soils of Tropical Florida.

2nd. By transmitting a detailed list of all books which the owner may deem necessary to enter into a botanical and vegecultural library, especially adapted to the tropical climate and productions of South Florida.

3rd. By transmitting a letter containing the desires of the writer in respect to the purchase of one or more shares of stock, in the Tropical Plant Company.

The trustees do not expect to receive any articles or services without returning an ample equivalent. All letters should be addressed to Charles Howe, postmaster, at Indian Key, South Florida, the financial trustee. All packages of seeds, &c., not exceeding two ounces, should be directed to the Patent Office at Washington, whence they will be forwarded to Indian Key. The proprietors of Green houses, &c. will render themselves especial services by sending their respective mites during the ensuing six months.

Even the druggists may contribute the valuable seeds, occasionally found among their tropical medicines. The trustees are James Webb, judge of the district at Key West; Charles Howe, inspector of the port at Indian Key; and Doctor H. Perrine, late American consul at Campeachy.

Indian Key, Tropical Fl., 25th Dec., 1838.

THE "MARL INDICATOR," NOT THE VERONICA ANAGALLIS," NOR "VERONICA BECCABUNGA."

To the Editor of the Farmers' Register.

June 9th, 1839.

I have perused the communication in the last number of the Farmers' Register, headed "The Marl Indicator, not a new species," over the signature of "Clayton." When I handed you the botanical description of the "indicator," I had not an opportunity of consulting any other authority than Loudon, nor have I any other now, except those published by the correspondents of Clayton, as stated in his communication. I would here take the liberty of respectfully submiting, that, to the best of my judgment, the marl indicator is *not* identical with either of the species of *veronica* described of the two correspondents of Clayton. The indicator agrees in some of its characters with the *veronica anagallis* (as described by the lady of Pennsylvania,) but differs so far from it in others, as to entitle it to be considered an entirely different species. From the species *veronica beccabunga,* the indicator differs widely; the leaves of the *beccabunga* are petiolate, those of the indicator are strictly amplexicaul, so much so as to appear at first glance, perfoliate. As formerly explained by you in the Register, the engraving of the indicator, does not correctly delineate its botanical characters; the artist who furnished the representation from which the engraving was taken, having overlooked the amplexicaul character of the leaves, representing them as petiolate; the error though important in a botanical point of view, might easily escape the notice of an artist who probably was not a botanist. In every other respect the engraving is a correct representation.

I considered the botanical description, accompanying the engraving of the indicator, sufficient to identify the growing species; but having another very fine specimen before me, upwards of two feet high, I will again more minutely repeat its botanical characters, as they present themselves in the specimen before me. Root fibrous, stem glabrous, (entirely free from pubescence,) ramose; leaves opposite, amplexicaul, lanceolate, slightly serrate; flowers racemose, axillary, terminal; calyx four-toothed; corolla light-blue, entire base, lip four-parted, reflexed, capsule two-celled; habitat, so far as I have observed, strictly confined to the eddies formed in streams supplied with calcareous matters.

The above description is, I believe, essentially correct, and such as will enable any botanist easily to identify the growing plant. I am still of the opinion that the indicator is a species of veronica not formerly described.

[It is the rule for this publication that every article shall have a title indicating its purport; and when the writer of any communication does not prefix such a heading, it is always done by the editor, who therefore must be charged with any unfitness or impropriety, that may be found in the titles to communications, in the great majority of cases. In conformity with this rule was prefixed to Clayton's communication the heading which reads "The Marl Indicator, not a new species," designing by it merely to announce the views which the writer presented—and without thinking at the monent, as has since occurred to our mind, that the words conveyed a more positive assertion than the writer himself would have made—or that, if charged to its proper source, it might seem that the editor took sides against the first describer of the plant, on a point in dispute in regard to which he is confessedly ignorant. There was no such intention; but, on the contrary, a wish to place on fair ground both sides and opinions, on a new and interesting question.

It has been requested by the 'Farmers' Cabinet' that a dried speciment of the "Marl Indicator" should be furnished for examination. This cannot well be done, so as to preserve sufficiently the natural appearance of the plant, owing to its being so extremely tender and watery. But the plant can be found from May to August in every rivulet flowing from or through a marl-bed, and can be readily recognized by the description and representation already furnished.—Ed. F. R.]

ENGLISH (OR COMMON) TURNIPS.

From the Maine Farmer.

In No. 7 of the present vol. of the Farmer, Mr. H. Butman states his opinion of the small value of English turnips as food for cattle. I have had some experience in raising and using that kind of turnips for fattening oxen, and cows, and have in six or eight instances fatted an ox or cow for my own use with English turnips, and always successfully. In one instance I suffered a cow to be milked until the 20th of September, and from that time to the 1st of November she had good feed upon grass only—at which time she was put into the stable, and fed with English turnips and hay, without any water, and kept constantly in the stable until the 1st of January, and was then excellent beef. The only additional food given to her was two bushels of Indian meal given to her during the last two weeks in December.

PERIODICALS OFTEN AFFECT THOSE WHO DO NOT READ THEM.

From the Cultivator.

J. Buel,—Sir,—I am disposed to mention one fact, which may encourage you in your arduous labors, and which may also show the important and responsible situation of editors and conductors of public journals.

In the course of the last summer a neighbor of mine invited me into his orchard to witness the effects of an experiment he had made, at the suggestion of another. Last winter one of his apple trees of considerable size was peeled around near the bottom by mice. He took four or five cions from the top of the same tree in the spring, and inserted them in the bark, one end below and the other above the naked trunk, in the manner of side grafting. When I saw the tree (perhaps in August) it was growing very vigorously, the sap having passed through the inserted cions. On seeing this I was determined to send you an account of it, that it might be spread out before the public in the Cultivator. Not long after this occurrence, I was reading one of the first volumes of this excellent work, which I had recently received, and found a description of a similar process there. I know not through how many hands this information had passed before it reached my neighbor, but it is certain he himself had not read it in the Cultivator. I mention this to show, that however extensively a useful publication may be circulated, its salutary influence may extend to hundreds, and thousands, who may never see it. On the other hand, let a publication be circulated containing articles which may be hurtful to the best interests of man, and its deleterious effects may be felt by thousands and millions, long after the publisher may have gone to give up his last account before his final Judge. O, how unspeakably important that every editor, and every one who presents any thing before the public eye, should never publish any thing but that may be useful to some one, either for time or eternity.

PLANTING SEED ENDS OF POTATOES. COMPARATIVE NUTRITIVE QUALITY OF ROOTS.

From the Maine Farmer.

Although potatoes are sufficiently plenty with us in this state, yet on account of the great demand for them at the west, they are uncommonly high in price. It is well therefore for those who are under the necessity of purchasing to be somewhat economical in the use of them. The seed ends cut off are nearly or quite as good to plant as the whole potato, and the remainder will continue as good or better to cook. Loudon asserts that the seed ends of potatoes will come up a fortnight sooner than the other end. We do not know this to be the fact; but if it be, it is an important one to the potato cultivator. Many farmers are in the habit of cutting the potatoes which they plant into several pieces and planting them promiscuously; but if the seed ends are so much earlier than the other parts, it certainly would be good policy to plant them by themselves, or plant them only, and use the other for other purposes.

Our correspondent R. and some others think they have hitherto held the ruta baga in too high esteem; and some are now engaged in crying them down, as much as they cried them up before. Now truth lies in the mean or middle way between the extremes. We have hitherto had some little experience in feeding different kinds of roots, to cattle and pigs in the winter.

We still hold them in high esteem. Some for one purpose and some for another. It is true that some of them rank higher in intrinsic qualities as food for man than others. The potatoes, for instance, are better for man, because they contain more farinaceous matter or starch than any of the others; but some of the others, but more especially carrots, are better for fattening or sustaining cattle.

One thousand parts of the potato yields of nutritive matter from 200 to 260 parts. This consists principally of starch with a little mucilage—from 15 to 20 of saccharine matter, and from 30 to 40 of gluten.

One thousand parts of the common red beet contain about 150 parts of nutritive matter, which is made up of 14 parts of starch, 121 of saccharine matter, and 13 or 14 of gluten.

One thousand parts of the mangel wurtzel contain about 136 parts of nutritive matter, of which say 13 parts are starch, 119 saccharine matter, and 4 gluten.

One thousand parts of the common flat turnip contain about 42 parts of nutritive matter, of which 7 are starch, and 34 are saccharine matter.

One thousand parts of ruta baga contain 64 parts of nutritive matter, of which 9 are starch, 51 saccharine matter and 2 gluten.

One thousand parts of the carrot yield 98 of nutritive matter, of which 3 are starch and 95 are saccharine matter; it also contains 2 or 3 parts of an extract which appears insoluble.

One thousand parts of the parsnip afford about 100 of nutritive matter, 9 or 10 of which are starch, and 90 saccharine matter.

The remainder of the thousand parts are vegetable fibre, useful to the animal that eats it in filling the stomach and aiding the digestive organs by what is called the "stimulus of distention," and very probably affording other aid to them, which we know nothing about and which cannot be detected by the chemist in his laboratory.

Compare almost any of the above roots, with the nutritive matter procured from the same number of parts of clover, or herds or timothy grass, as they call it at the south *(phleum pratense.)*

One thousand parts of the clover contain about 40 of nutritive matter, of which say 31 or 32 are starch, 3 are saccharine matter, 2 are gluten and 3 are an insoluble vegetable extract.

There are different results obtained by chemists, in regard to the nutritive qualities of herds grass, but some put it down as 100 in a thousand parts.

Now if we take into the account the number of lbs. of each root which is ordinarily obtained from an acre, and the cost of production, an approximation may be had of the comparative value of each crop; and by fairly understanding the matter we shall not be likely to be carried away by our partialities for this or that crop to day, or by disappointments in regard to them to-morrow.

HEN COOPS.

From the Maine Farmer.

Hens are useful—valuable, and as profitable as any stock on the farm; but like other stock they should have an enclosure by themselves at certain seasons of the year, especially in the spring when the sowing and planting begins. A very cheap and convenient yard may be made for them by taking common boards, and a suitable number of posts—nail the boards so nigh together that the hens can not get through between them. This frame need not be more than four or five feet high. Then at the top nail on some shingles cut so as to make sharp points, and nail them up say two inches apart. Laths cut and nailed on are better—or narrow sticks split and made sharp, and nailed on, will, answer the purpose. A door of convenient size may be made to go in at. The hens may then be put in and there will be little danger of their attempting to scale the walls. The sharp points sticking up all round, look too formidable. The philosophy of the thing, is this. The hen is not very good for flight, and when she attempts to fly over any thing, she almost invariably lights upon it, and then jumps off. As they cannot light and rest upon these sharp points, they cannot get over very conveniently, and should any succeed in flying over at a single leap, their wings may be clipped. When put into one of these coops, food should be kept by them constantly, and also water—a little ashes for them to shake up among their feathers in a sunny day, some gravel to grind their food with, and some lime to manufacture into egg shells. When thus supplied, they will lay as well, and do as well here as when out ranging about. We keep our hens and turkeys in such a yard, and find that they do extremely well.

SOAP MAKING

From the Genesee Farmer.

We recently mentioned some of the necessary requisites in the manufacture of common soft soap, without an attention to which, failure would be the consequence. We have since been furnished with the following particular statement of the whole process by an experienced manufacturer, who has never, in a single instance, failed in making good soap by this method.

The leach-tub should hold about four barrels. In the bottom of it put a little straw to prevent the ashes from falling through. Put in a pailful of ashes and pack it down. Then put in two quarts of *quick-lime;* fill the tub with ashes, packing it closely with a pounder, and leaving the upper surface concave so as to hold two or three pails of water. Fill this cavity with hot water as fast as it soaks in the ashes, till ten or twelve pails have been poured in. Let this be done in the evening. Let it remain about 12 hours. If the ley begins to run from the leach-tub in this time, try it with an egg; if it bears the egg, it is strong enough. If it has not begun to run at the expiration of the twelve hours, add cold water until it does. If it will not bear an egg, pour the ley upon the ashes again, until it becomes sufficiently strong. If the ashes are good, this quantity will make a barrel of soap.

Put the soap-grease into a vessel over the fire, stir it frequently until it boils, then add a small quantity of ley and make it boil. Add sufficient ley at intervals of about two or three hours, to have two gallons of ley to four pounds of grease. If the ley should begin to run weak before a sufficient quantity is obtained for this purpose, do not add it until the previous contents of this kettle have boiled nearly enough, except a little should be necessary to prevent its boiling over. To ascertain whether it has boiled sufficiently, mix a small quantity of the newly made soap with an equal bulk of water, and let it cool. The appearance will at once show if the soap be good. When this is found to be the case, add as much cold water as there is ley, stir it well, and the work is finished.

If the ashes are not packed closely enough, the water passes through too rapidly and the ley is weak. If packed too closely, the water cannot get through during the twelve hours. There is however, little danger of the latter.

If the ley is not strong enough, it will require sometimes a day or two of boiling before good soap can be made. This should, therefore, be previously well attended to.

If the ley should stand a day, it will not unite with the grease; or if it should, they will separate when they become cold. This appears to be owing to the combination of the carbonic acid of the air with the potash of the ley, rendering it less caustic. If so, the evil might at once be removed by the addition of quick-lime to the ley.

It appears that the corroding quality of soap is owing to a deficiency of grease. If this is the case, the addition of an excess of lime, in making the potash caustic, would not produce any bad effect.

Good soap is sometimes made from ashes of the maple without any lime, but beech ashes absolutely require it.

The consistency of the soap is in a great measure regulated by the addition of water at the end of the process. If the soap is too thick and brittle, it is very liable to become wasted in using. To be in the best condition, it should be quite tenacious.

To preserve the grease from becoming mouldy or spoiling, it should be kept in weak ley.

A pine tub is the best thing to keep the soap in —an old tar barrel answers admirably although it imparts a dark color to the soap at first, but does not injure it. Oak has the texture soon destroyed by the soap, and the tub bursts open.

THE AGRICULTURAL INTEREST.

From the Genesee Farmer.

We are happy in giving the following extract from a letter to us, from Mr. Triplett, of Kentucky, on the important subject of legislative aid to agriculture. We have the more pleasure in doing this, as the sentiments are just and forcibly expressed, and agree with the opinions so often expressed by us in the Farmer, and which we are confident will ultimately prevail. It is but a few days since an honorable senator, in his place at Albany, declared, that the project of aiding agriculture by legislative enactments, was "*the most arrant quackery.*" If quackery, in this case, why is not aid from the same source, quackery in other cases? It was this legislative quackery, that incorporated our colleges, and *endowed* them; that surrounded the professor of the law with exclusive privileges and numberless ways of acquiring wealth and power, that are forbidden to the people; and by so doing, placed *that man* in a situation to sneer at, and injure those who aided his rise. When what are termed the professions ask for aid, the vaults of the treasury are *thrown* open; when those who have deposited the cash there, ask for the *use* of a few thousand dollars of their own money, they are repulsed with taunts and sneers. The evidence is daily becoming more clear, that farmers must see to their own legislation, or it will be left undone. But to our correspondent:—

"Considering the vast importance to our country, of the agricultural interest—it being the very basis of all others—without the prosperity of which all others dwindle—it is strange that it is so overlooked and neglected in the legislation of our country. Manufactures, commerce and navigation, are all found to be benefited by a little legislative aid, but agriculture is supposed not to need it. I am against too much legislation. It is one of our errors, and ever will be in a republic. But while there is too much on other subjects, there is too little on agriculture. I will illustrate the evil felt in some instances, and show how legislation might remedy it. We see accounts in the journals, of the day, of improved farming implements, and labor saving machines, &c. A farmer purchases, say, a reaping machine. It does not answer. He curses the impostor, and forswears all humbugs. He is told he did not get the right article. But how is he to know the right one? Certificates have little value; we believe in none of them. In the course of time perhaps a *neighbor* gets the right implement, and *when he sees* its operation, he will buy one. I have had myself a knowledge for several years of various improvements, which I have been anxious to adopt, but have waited to see them introduced and proved by others; not wishing to be humbugged myself. In these improvements, real ones spread but very slowly. How rapidly would our prosperity advance, if the march of those improvements could be expedited, and show how much could that be done, if each state would have a *model farm*, where all reported improvements could be fully tested, and reported on by authority that could be confided in; and where the operation of the thing itself could be seen. There, too, manufactories of the most improved articles could be established, and the implements or machines furnished at the most reasonable rates. Pure seeds, plants, &c., could also be had at such a farm; and what would be the expense? $6,000 per annum would borrow $100,000, which would amply suffice for the establishment, including a large farm, which would be annually increasing in value, and the income from which might be made, by good management, much, if not all of the interest on the cost; for the implements, seeds, &c., would all be considered as proved, and the demand, for them would be almost unlimited. There, too, could be demonstrated the best methods of agriculture in every branch. Much speculation would be put to rest. Any improvement, when shown to be such, would be quickly adopted, and agriculture advance with rapid strides. I do not pretend to say, there may not be more advisable modes of advancing the agricultural interest; but I am well convinced that such a plan would render it a great service. The best stocks of domestic animals could be concentred on these farms; all grains, seeds, implements, machinery, &c. &c., and an agricultural school might be attached to it.

Such plans, or similar ones, I believe, have been repeatedly suggested; but it seems, that as yet, the public mind has not been sufficiently enlightened to be ripe for it. I think, however, that every agricultural journal ought to urge it, until the subject is taken up, and some such plan adopted."

SHEEP TICKS.

From the Genesee Farmer.

Farmers sometimes ask how they shall contrive to free their flocks from the sheep tick, since every one is aware that if these pestiferous insects abound, it is impossible to keep the animal in good order, or prevent a serious diminution in the quantity of wool. Some have recommended mercurial ointments, but these are always dangerous, and should only be resorted to in cases of necessity arising from disease, such as the scab, or other obstinate cutaneous diseases. Some have proposed dipping in an infusion of tobacco, and this would, in our opinion, be preferable to ointments containing mercury; but this occasions considerable trouble, and to be efficacious, must be performed with more care than is usually given to such matters.

We will tell how we manage this matter. We do not keep a large flock, only one or two hundred, yet our system is applicable to any number, and for several years past not a tick, or scarcely one, has been seen on our sheep. In the first place, we wash our sheep in a large tub, of such capacity that the sheep cannot reach the bottom, and wide enough at top to allow two to wash at once. The tub is kept full and running over slowly, by a small stream conducted into it of clear, pure water. In washing our sheep, soap is always used at the rate of about two gallons to a hundred, and after a few have been washed, the water in the tub will be strongly impregnated with soap, or in other words, will be soap suds. This cleans the wool and the sheep thoroughly, and by letting the sheep remain a few days after washing in a clean pasture, the wool becomes again saturated with the oil which is so essential to its softness and elasticity. This is the first step in freeing the animal from ticks. At shearing, it is well known, when this operation is performed as it should be, and no places where it is only half cut by the shears, or taglocks around the belly and legs are left to give the vermin a hiding place, that they will quit the old sheep for the lamb, in the wool which they find a secure place of retreat. To get rid of them fully and finally, we now *shear our lambs.* Some farmers apprehend that such a process would injure the lambs, but the experiments we have purposely made, and the experience we have had, has convinced us that such fears are groundless, either as respects the animal itself or the effect on the next clip of wool. Let any farmer whose sheep are rendered poor and sickly by the constant irritation of these insects, try washing them in soap suds, and at the proper time shearing the lambs, and we think he will make no more complaints of ticks on his sheep.

CURE FOR GRUBS IN HEAD OF SHEEP.

From the Genesee Farmer.

Having read considerable in the Genesee Farmer concerning diseases in sheep, and seeing no account of the grub in the head, I think proper to give the public a relation of a circumstance which took place with me when I had a small flock of sheep. It was in the latter part of winter, one of my flock was taken sick, and became so week it could not rise without being lifted. I suppose its ailment to be the grub in the head; and knowing something of the virtue of flax-seed oil, I resolved to try an experiment on it. I laid the sheep on its rump, or rather on its back, with its nose a little inclining backward, and poured in near a table spoonful of the above oil, part in each nostril. The next morning the sheep was able to get up and eat with the rest of the flock, and speedily recovered. After that, and while I kept sheep, when I discovered any of them snotty-nosed and coughing, (an indication of the grub,) I put a little oil in their noses as above, and they soon became clean and healthy. I do not remember that I failed in one instance; some of my neighbors also received benefit by the above process.

T. B.

Columbiana county, Ohio, 5th mo. 18, 1839.

IMPROVED DURHAM SHORT-HORNS.

[Subject continued from page 350.]

From the Whip.

What we have said, it is considered, will render superfluous any attempt more particularly to describe the short-horns. Of course they will be found to vary greatly; but sufficient may be collected from what is presented to the reader to inform him as to the character of this superior breed of cattle. The next object, then, will be to show their capabilities to make a return for food consumed, and the unparalleled early period at which such return may be made. Indeed, *early maturity* is the grand and elevating characteristic of the short-horns, and their capacity to continue growing, and at the same time attaining an unexampled ripeness of condition at an early age, has excited the wonder, and obtained the approbation, of every looker-on not blinded by prejudice.

In order to do justice to the subject, and to show that these properties are not all of recent acquirement, but were possessed in an eminent degree by the Teeswater cattle, as well as the improved short-horns, it will be requisite to return to the former for a few facts in evidence.

About fifty years ago, Sir Henry Grey (of Howick) bred two oxen, which were fed by Mr. Waistel, and when six years old weighed 130 stones each, 14lb. to the stone; their inside fat being most extraordinary.

A heifer, three years old, bred by Miss Allen (of Grange) fed on hay and grass alone, weighed 90 stones.

Two three-years' old steers, bred by the same lady, and similarly fed, weighed respectively 92 and 96 tons.

Mr. Waistel's four-years' old ox, by the bull supposed to be the grand-sire of Hubback, weighed 110 stones.

A four-years' old ox, bred by Mr. Simpson (of Aycliffe) fed on hay and turnips only, weighed 135 stones.

About the same period, a five-years' old heifer, bred by a bishop of Durham, weighed 110 stones.

A cow of Mr. Hill's slaughtered in Northumberland, weighed 127 stones.

Mr. George Coates, before-mentioned, slaughtered a heifer, by the supposed sire of Hubback, which, fed on turnips and hay, weighed, at two years and two months old, 68 stones.

An ox and heifer, bred by Mr. Watson (of Manfield) weighed, at four years old, within a few pounds, 110 stones each.

A sister to Mr. G. Coates' *Badsworth*, having run with her dam, and fared as she did, without cake or corn, met with an accident, and died when seven months old; she weighed 34 stones.

A steer, by a brother to the above heifer, three years and two months old, weighed 105 stones, and another steer, by the same bull, exactly three years old, weighed 95 stones. Both were kept as store-beasts till two years old.

An ox, bred by Mr. Hill (of Blackwell) slaughtered at six years old, weighed 151 stones, 10lb; tallow, 11 stones.

The Howick red ox, seven years old, weighed 152 stones, 9lb; tallow, 16 stones, 7lb.

Mr. Charge's ox, seven years old, weighed 168 stones, 10lb; tallow, 13 stones.

The foregoing instances of weight and proof satisfactorily show, that in the Teeswater cattle, Mr. Charles Collins had pretty good materials with which to commence operations. Let us now refer to a later period, and state some particulars respecting their decendants, the improved short-horns.

In the year 1808, Mr. Baily, the agricultural historian of Durham, informs us, he saw, at Mr. Mason's (of Chilton) a cow, not less remarkable in point of fat than the Durham ox. At that time, the depth of fat, from the rump to the hips, in a perpendicular position, was not less than twelve inches; and the shoulder score, at least nine inches thick.

Mr. Robert Colling's heifer, which, like the Durham ox, was exhibited as a curiosity, was estimated, at four years old, to weigh 130 stones.

The same gentleman sold, in Darlington market, on the 18th of April, 1808, a two years old steer for £22; the price of fat stock being at that time seven shillings per stone.

At Mr. Nesham's (of Houghton-le-spring) Mr. Bailey saw a steer, 25 months old, completely covered with fat over the whole carcass, and supposed to be the fattest steer of his age ever seen. Butchers estimated him to weigh 75 stones. Neither of the last mentioned were of large size, and would not have weighed above 40 stones had they been no fatter than those usually slaughtered.

Mr. Wetherill (of Field House) sold at the fair in Darlington, in March, 1810, two steers, under three years old, for £47 10s. each. The price of cattle at that fair, 10s. per stone.

Mr. Arrowsmith (of Ferryhill) who fed off his short-horns at two years old, furnished the following particulars of the prices he obtained from the butchers: viz.

In 1801, sold four for £25 each; two steers and two heifers.

1802, six for £17 10s. each; three steers and three heifers.

1803, four for £17 each.

1804, six for £18 10s. each.

1805, six for £17 10s. each; two steers and four heifers.

1806, four for £16 each.

1807, eight for £18 each.

1808, eight for £19 each.

The time of selling, from the beginning to the latter end of May. Management. In the first winter they got straw in a fold-yard, with nearly as many turnips as they could consume; in May they went to grass; in November put to turnips through the winter, and turned to grass the first week in May.

A twin heifer, belonging to Mr. *Arrowsmith*, calved the last week in April, being kept the first year as the store-stock, was entered for a sweepstakes, to be shown in June, at which time she would be two years old. She was immediately turned to grass in the usual pasture. In November she was estimated to weigh 28 stones; when she was put to the ruta baga and hay, and oil cake, of which she ate 4 cwt., with two bushels of bean-meal and 1 bushel of barley. She went to grass again on the first of May, and from that period had neither cake nor corn. On the 23d of July, it was the unanimous opinion of the best judges that she weighed 58 or 60 stones; having gained 30 stones in 30 weeks.

In April, 1808, Mr. Hailey saw, at Mr. Arrowsmith's, eight yearlings, intended for the course of feeding described as adopted by that gentleman; whose sales, from 1801 to 1808 inclusive, have been already particularized. They were very lean, not more than 15 stones each; and had they been offered for sale in a fair, no person, unacquainted with the breed, would have given more for them than £4 10s. or £5 per head.

Mr. Walton (of Middleton in Teesdale) had been, in 1808, in the habit of selling his steers, at two years and a quarter old, at from £20 to £30 each; their weight being 50 to 54 stones, fed solely on vegetable food. He often, for the sake of experiment, bought in calves of the unimproved, or old breed of the county, and he uniformly found that his own at two years old got fatter, and fitter for the butcher, than the others did at three, although fed and kept exactly alike.

Mr. Mason (of Chilton) in the course of an experiment to ascertain the weight of beef gained by the food given, (turnips,) found three steers, under 3 years old, to have gained 20 stones each in 20 weeks. The three steers averaged 70 stones each.

In 1816, Mr. Nesham's steer, three years and a half old, obtained the premium offered by the Durham Agricultural Society; his weight was, 4 quarters, 96 stones, 1½lb; tallow, 11 stones, 7lb; hide, 8 stones.

Major Rudd (of Marton in Cleveland) obtained the premium offered by the Cleveland Agricultural Society in 1811, for the best steer under three years old, and fed on vegetable food. The steer was sold to the butcher for 10s. per stone, and slaughtered when three years and thirteen days old; the weight of his 4 quarters was 96 stones.

The late Mr. Robertson (of Ladykirk, near Berwick-upon-Tweed) furnished the writer with the following particulars of short-horns, bred by him, and fed with few exceptions, on vegetable food:—

1794—An ox, four years, ten months old; 4 quarters, 145 stones, 3lb; tallow, 24 stones, 7lb.
A steer, under four years old; 4 quarters, 106 stones; tallow, 19 stones, 7lb.
1814—A steer, three years, nine months old; 4 quarters, 101 stones; tallow, 15 stones.
1815—A steer, three years, eleven months old; 4 quarters, 112 stones, 7lb; tallow, 26 stones.
A heifer, three years, eight months old; 4 quarters 89 stones.
1817—A steer, three years, two months old; 4 quarters, 95 stones, 10lb; tallow, 17 stones, 10lb.
1822—An ox, four years and a half old; 4 quarters, 135 stones; tallow, 21 stones.
Own brother to the foregoing, three years and a half old; 4 quarters, 133 stones; tallow, 21 stones.
A steer, three years, ten months old; 4 quarters, 124 stones; tallow, 17 stones.
A steer, three years, eight months old; 4 quarters, 112 stones; tallow not weighed.

A steer, bred by Col. Cooke (of Ouston, near Doncaster) fed on potatoes and straw, was slaughtered when two years and twenty-two days old; his 4 quarters weighed 72 stones.

Mr. John Rennie (of Phantassie) produced, at the East Lothian Agricultural Society's meeting, in November, 1823, a steer, from eighteen to twenty months old; the 4 quarters of which weighed 118 stones, 1 lb. Smithfield weight.

The same gentleman produced before the Highland Society of Scotland a steer, aged two years, four months, whose 4 quarters weighed 153 stones, 7lb: also a steer, aged three years, six months, whose 4 quarters weighed 1169 stones, 7lb.; tallow, 30 stones, 1lb.

Except in the three last instances, all the weights given have been by the stone of 14lb.

Should the foregoing statement be considered to have been unreasonably extended, it is presumed it will, at least, be admitted, that its ample detail, if attended to, will establish the credit of the short-horns as an invaluable breed to the grazier.

We will take a very rapid survey of the few counties not already decribed, and in which the short-horns are the prevailing breed.

Cumberland.—The native breed of Cumberland was a small long-horned beast, yielding a fair quantity of milk, and of good quality; answering well for the dairy, but not so profitable as grazing cattle. With these were intermingled the Kyloes and the Galloways, both of them quicker feeders than the old Cumberlands. They were generally bought in about October, and turned all the winter on the pastures out of which the fat cattle had just been sold—a little hay being allowed them, according to circumstances. They were kept about a twelvemonth and paid very well.

The long-horns were most used for the dairy, and chiefly for the production of butter. They yielded from one to two firkins per annum, according to their goodness and size: the average produce was about 84lb. per cow. Some of them would yield eight quarts of milk per day during the season, and three or four pounds of butter per week. The Cumberland butter used to be in considerable request. The cheese was an inferior article, and chiefly made of skimmed milk.

The short-horns were not slow in penetrating into Cumberland, and establishing themselves there. They were first used to cross the native and Scotch breeds, and sometimes with considerable success. Mr. Bates, of Halton Castle, attempted a cross between the Kyloe cow and the short-horn bull. His object was to increase the quantity of milk from the Kyloe, and to preserve its quality; and to gain that, which every one used to imagine the short-horn was sadly deficient in, hardiness. He hoped likewise to reduce the great consumption of food by the short-horn, and at the same time, to retain his early maturity. To a very considerable extent he succeeded. Mr. Maynard, than whom there could not be a better judge of cattle, and from whose stock descended some of the best short-horns of the north, hired a bull from Mr. Bates, to try what effect would be produced on some of his own pure breeding stock. That the short-horns could be materially improved by such an admixture could scarcely be expected; but the value of the old breed of the country has been materially increased.

The pure short-horn is now zealously cultivated in Cumberland, and by none more so, or more successfully, than by Mr. Maynard.

Yorkshire.—North Riding.—There are few parts of the kingdom in which so perfect a change has taken place in the breed of cattle as in this extensive division of Yorkshire. Mr. Marshall, who is undoubted authority here, says, in his *Rural Economy of Yorkshire*, at the commencement of the eighteenth century, the ancient black cattle were the only breed in this district. They resembled the present breed of the lowlands of Scotland, mostly horned, but some of them *humbled.* To these succeeded the long-horned or Craven breed, and which by degrees, spread over the whole of the northern and midland counties. At that time the chief work of the farm was done by cattle; the horse had not yet quite superseded the slower, but perhaps more profitable, ox; and many of the long-horns, until they began to be improved by the breeders in the midland counties, were deficient in several valuable points, while the use of them was exceedingly inconvenient, and sometimes dangerous, in the yoke.

On these accounts, the long-horns in turn gave way to the Holderness, or short-horn breed, and that, for a century past, has maintained its ground, and will continue to do so.

Mr. Marshall gives a singular account of these cattle, when first introduced. He says, that "the Holderness breed were thin quartered, too light behind, and too coarse before; large shoulders, coarse necks, and dewlaps. This form being found disadvantageous to the butcher, increasing the quantity of the coarser parts, and reducing the weight of the prime pieces, the breeder endeavored to enlarge the hind quarters; and had he stopped when he had got to the happy medium, he would have wrought a good work; but the fashion was set—cloddy buttocks were in estimation. The first variety of this species of cattle, which I can recollect, was a thick, large-boned, coarse, clumsy animal, remarkably large behind, with thick gummy thighs; always fleshy, but never fat, and the flesh being of a bad quality. This, however, was not the worst: the monstrous size of the buttocks of the calf was frequently fatal to the cow, and numbers of cows were annually lost in calving. These monsters were stigmatized by the epithet 'Dutch buttocked,' and they were probably the worst breed the Vale ever knew."

This evil, however, soon cured itself; and, by judicious crossings from their own stock, and, soon afterwards, from the stock of the enterprising and skilful breeders on the banks of the Tees, the Yorkshire cow was brought to her present state of perfection, retaining, with little diminution, the milking properties of the Holderness, and the grazing ones of the improved short-horn. The old and comparatively unimproved breed is still indeed found in the possession of most of the dairy farmers of this part of the country, for the prejudice—and, as we have confessed, not an unfounded one—against the improved short-horns, that their milking properties have been sacrificed to the accumulation of fat, still widely prevails. Experience, however, gradually established the fact, that it is prudent to sacrifice a *small* portion of the milk to assist in feeding, when too old to continue in the dairy; or when, as in the neighborhood of large towns, her service as a dairy-cow are dispensed with at an early age. This cross being judiciously managed, the diminution of milk is so small, and the tendency to fatten so great, that the opinion of Mr. Sale (as quoted by Mr. Sneldon Cradock, of Hartforth, and to whom we return our thanks for some valuable information) is perfectly correct—I have always found, in my stock, that the best milkers, when dried for feeding, make the most fat in the least time." This is a doctrine which will be better understood and universally acknowledged by and by. Too many of the improvers of the short-horns have done but half justice to their excellent stock. He would deserve well of his country who, with skill and means sufficient, would devote himself to the illustration of this point.

It has been observed, that the cattle of this district have not improved of late so rapidly as in former times. There may be two reasons for this, viz., that the system of breeding *in-and-in* has been pursued somewhat too far, and that the depreciation of the times has withdrawn many landed proprietors from agricultural pursuits, and thus lessened that competition which was the most powerful stimulus to exertion.

The average weight of cattle in this riding of Yorkshire varies with the food and age of the animal. A steer from two and a half to three years old, when fit for the market, will usually weigh from sixty-five to seventy-five stones, imperial weight, and a heifer from fifty-five to sixty-five stones. The usual method of preparing them for the market is simple enough. The calf gets milk for the first two or three weeks, and after that, scalded skimmed milk, mixed with oil-cake boiled in water, with hay and turnips, until the spring pastures have sufficient produce to support him; he remains in them until the following winter, when he is either tied up, or turned loose into folds, and fed with straw and turnips until the ensuing May: he is then turned once more into the pasture until winter, when he is brought into the fold-yard as before, until nearly May day; and now, approaching to a state nearly fat enough for the *butcher*, three or four months grass-feeding generally completes him. Both the improved and the unimproved cattle are treated in the same way. Now, however, appears the essential difference between the breeds; the most forward of the unimproved are scarcely ready, when the improved cattle are gone, and they are never so fat and pointy as the others.

Upon the clay soil of Cleveland, and other parts of this district, the grass land is principally appropriated to the purpose of the dairy. There the unimproved breed mostly prevails; but even there, the most intelligent of the farmers begin to see the propriety of a cross or two from the Teeswater blood. The young cattle are principally sold in the neighboring markets, and are forwarded to the possessors of extensive turnip farms in Leicestershire and Northamptonshire.

A great proportion of the cows for the *supply* of the metropolitan dairies come from the *North* Riding of Yorkshire. They are sent away within a month or six weeks after calving; and either journey directly to London, or halt for a year or two in Bedfordshire, or some of the midland counties, in order that they may not reach their ultimate destination until they are five or six years old.

Among the breeders of the pure short-horns, in this Riding, Major Bower, of Welham, deserves honorable mention. His name appears among the purchasers at Mr. Charles Colling's sale. His cow Daisy, bought there, produced some excellent stock. A heifer of his breed, slaughtered at the age of eighteen months, weighed sixty-four stones, imperial weight, and ten stones of tallow.

The Earl of Carlisle formerly endeavored to improve the breed of this district by crossing with the Devonshire, and Mr. Cleaver with Sussex cattle, and it was said that more kindly feeders were obtained; the size was reduced a little, the leg shortened, the bone rendered finer, the form improved, and the strength of the short-horn remained for draught with the activity of the Devon. Whatever might have been the case with the first cross, this supposed improved race has passed quite away.

A cross between the short-horn bull and the Argyleshire heifer was attempted, with great prospect of success. Mr. Bates had obtained some excellent cattle from a similar attempt, but they could not be fed to an equal weight in the same time, and they were deficient in early maturity.

West Riding.—This is principally a manufacturing district, and there are comparatively few agriculturists who pay much attention to the improvement of the breed of cattle. The short-horns, either the Holderness, or with some crosses of the Durham, are chiefly found in the neighborhood of large towns. More in the country, and where the farms are small, (as they are through a great part of this Riding), there are a variety of crosses with the long-horns, and with nondescripts of former days. They go under the characteristic name of *half-horns;* the country people are fond of them, they are hardy, yield plenty of milk, and fatten with tolerable quickness. One would wonder how they retain one good quality, for Mr. Sorby, of Holylandhall, very characteristically describes them, and the little farmers of almost every district—"Those who have a cow or two, of some favorite kind, send them to the nearest bull, which does well enough, provided he gets them a calf. We must confess, that we never saw so great a collection of mongrels as in the manufacturing portion of the West Riding.

Mr. Newman, the agent of Lord Fitzwilliam, satisfactorily accounts for this. He thus writes to us. "The breed of cattle in the greatest esteem in the vicinity of Wentworth, and in fact throughout all the southern part of the West Riding of Yorkshire, is the pure short-horn. A traveller, however, passing through this district, will observe many deviations from that breed, and will meet with crosses that he will have much difficulty to identify. The farms are small, and the farmer has a kind of mixed employment, partly agricultural and partly mercantile: hence his attention is not so much directed to his farm as it should be, and hence arises a certain degree of carelessness as to the selection of his cattle; added to this, there is an idea, although an erroneous one, that the pure short-horns are not good milkers, and which tends materially to check the breed.

In the districts near Doncaster, where the population is more strictly agricultural, the short-horns prevail, and those of a breed and quality highly creditable both to the mere tenant farmer and to the gentleman who farms his own estate.

It is due to the memory of the late Mr. Mitton, of Badsworth, to place him at the very head of the improvers of short-horn cattle in this district. His "Old Bull," known in the Herd Book by the name of "Badsworth," is still in the recollection of the farmers of that neighborhood, and no animal contributed more to the improvement of the cattle for many miles round.

About the year 1805 the Wortley Farmer's Club was established, chiefly by Lord Worncliffe (then Mr. Stuart Wortley); and by the operations of that society very considerable improvement was effected in the breed of cattle, sheep, and pigs, round Wortley. In 1818, this society ceased to exist, for one more effective had been formed at Doncaster, under the patronage of Earl Fitzwilliam, Lord Althrop, Sir A. Cooke, and Mr. Fullerton of Thrybergh Park, and other neighboring gentlemen. This society still flourishes, and a very fair number of excellent cattle are annually exhibited, the males of which become dispersed through a wide district of country. The short-horn cattle have born away all the prizes.

In almost every part of the West Riding, many Scotch cattle are fed for one year or two, and then sold to the butcher to be slaughtered for home consumption.

As we advance towards the moorlands of the west and north-west of the district, the half-horns prevail more; and in Craven, the native country of the long horns, we find both the large and the small variety of this breed in tolerable perfection, but perhaps not so much so as in the north of Lancashire. Even here, the short-horns have penetrated and are increasing.

East Riding.—The short-horns prevail universally through this riding, except among the cottagers and little farmers, who still obstinately cling to some of the different varieties of half-horns. It is decidedly a breeding country, and a great number of cows are yearly sent from it to Lincolnshire, to be prepared for the London dairies; yet many oxen and cows are brought from the Wolds to the fortnightly and weekly markets so frequent in Yorkshire, and pastured on the rich ground with which the riding abounds.

Lincolnshire.—Mr. Berry has disposed of the Lincolnshire cattle in a very summary way, and we apprehend that no appeal can be made against his decision. "There is a large coarse short-horn prevailing, particularly in Lincolnshire, denomination in the quotations of the Smithfield markets 'Lincolns;' but they have no further affinity with the improved short-horns than as the latter have been referred to for their improvement, which has been accomplished to a considerable degree." As, however, we have to travel through each of the counties of Great Britain, we must enter a little more into the consideration of the character and claims of the Lincoln cattle.

Many of the present unimproved Lincolns may be regarded as fair specimens of the best of the old Dutch cattle. So prevalent is the opinion that this was the origin of the breed, that the metropolitan butcher denominates them Dutch cattle, and knows them much better by that name than as Lincolns. There is a coarseness about the head and horn which we have not seen either in the common Holderness or the improved Durham; the bone is comparatively large, the leg high, and the hips and loins wide, approaching to raggedness. Mr. Lawrence has a very appropriate remark respecting them, that they demand that Bakewellian improvement which their sheep have received.

There have been some zealous, and, to a considerable degree, successful improvers of this breed. At the head of them stands Captain Turnbill, of Reesby on the Wolds. With what materials he went to work is not certainly known; but it is supposed that he confined himself to a selection from the native breed; and certainly he produced a valuable animal, thinner in the horn, cleaner in the bone, lighter in the dewlap, shorter in the leg, full in the bosom, and round in the carcass. The breed was properly called "Turnhill's," and they yet remain in the hands of many farmers. They are handsome looking beasts, always full of lean flesh; with far greater disposition than before to put some fat on that flesh, and become sooner ripe for the market.

Others with somewhat more judgment, called in the aid of the Durhams, and more spedily and effectually completed their object. They took away the disposition to make lean beef only, although in very great quantities; and if they could not perfectly give to the Lincolns their own early maturity, they materially quickened the process of fattening. An improved Lincolnshire beast is therefore now a very valuable animal; and if a finer grain could be given to the meat, the great quantity of muscle, compared with that of fat, would be no disadvantage.

After leaving the land, or the cow, the young cattle are kept during the first winter on hay, hay and turnips, or sometimes hay and a little oil cake. In the next summer they run on seeds or second rate land, and too often get nothing but straw in the winter. At two years old they fare no better, except that some now give from two to four pounds of oil cake daily; and they are sold, in the spring or summer, by those who have not the means to feed them, to jobbers, who dispose of them to the grazier. He winters them better if he buys them at the latter end of summer, and feeds them off before another winter; but if they are brought in the spring they are generally fed off before winter, many of them being put up for stall feeding, to which no breed is better adapted."

The Lincolnshire cattle are principally red and white, but a dun variety was introduced, about the middle of the last century, by Sir Charles Buck, of Hanby Grange, and which have so much improved in size, as almost to overtake the common breed of the county. They are found principally in the neighborhood of Folkingham, and have been fed up to one hundred and sixteen stones at seven years old.

The extraordinary animal which was exhibited under the name of "the Lincolnshire ox," although bred in that county, was an improved short-horn; and many of these are establishing themselves in every part of Lincolnshire.

Here, as in most other districts, there are great varieties of breeds, and which are said to be increasing, and even interfering with the purity of the native one, by means of the great annual importations of Irish cattle.

Some have purposely and very recently endeavored to establish a cross between the best of the long-horned Irish and the short-horns of the county: but the attempt, although promising some success at first, has decidedly failed.

Among the small farmers, half-horns of every size and variety are found, and they are crossed in every way that caprice or folly can suggest, yet they are most of them good milkers. The Lincolns, although better adapted for grazing than for the dairy, yield more milk, and of a richer quality, than some of the advocates for the old order of things are willing to allow.

Essex.—There is no distinguishing breed in this country; but the chief agricultural business, so far as cattle are concerned consists in the suckling of calves and grazing in the marshes, with some attention to the dairy in particular districts.

Our friend, Mr. May, veterinary surgeon at Maldon, informs us, that the suckling farmers procure their calves at the principal markets, viz., Romford, Chelmsford, Maldon, Braintree, and Colchester. The Romford market is chiefly supplied from London; Chelmsford and Maldon from London and Suffolk; and Colchester and Braintree chiefly from the Suffolk dairies.

They are brought in at from a week to a fortnight old, and are generally fed about twelve or fourteen weeks, when they are either brought by the butchers in the neighborhood, who kill and dress them, and send them to the London market or they are sent alive to the Romford and Smithfield markets, where they are purchased by the London butchers.

Many of these calves used to be reared in the rich pastures of Essex, and particularly the heifer calves from the metropolitan dairies; and many a cow went from Essex to keep up those establishments; but this practice is now almost totally discontinued.

The marshes afford excellent grazing for cattle that are not affected by the brackishness of the water, and there are few who suffer materially by this. When cattle are not perfectly ready for the market, a few weeks's grazing on the marshes will bring them rapidly forward. Some are purchased in store condition, in order that they may run three or four months on this luxurant pasture, and at the expiration of the time they are ready for Smithfield. At some periods of the year these flats are covered with cattle, chiefly of a small kind, and mostly the Welsh and Scotch runts; indeed the grazing is principally confined to these small cattle. A few farmers, however, in every part of Essex apply themselves to the regular grazing of cattle of a larger size. A few have the Devons, among whom must be reckoned Lord Western, who is partial to these cattle, both to feed and for the dairy. When they are grass fed, there are always some Scotch or Welsh runts as *trimmers*, i. e. to eat down what the larger and more valuable cattle leave. Many Herefords are prepared for the London market in the same manner.

The dairy business is confined to a comparatively small part of the county. A considerable quantity of butter is made in the neighborhood of Epping, and sent to the metropolis in small rolls; and it is deservedly celebrated for the peculiar sweetness of its taste. This depends *not on* the kind of cow, for occasionally a dairy contains half a dozen different breeds of cows, although the short-horns are the most prevalent; but because they feed during the summer in the shrubby pastures of Epping Forest, and the leaves of the trees, and of numerous wild and aromatic plants which there abound, impart to it its peculiar sweet flavor. The consumer, however, can seldom be certain that he has the real Epping butter, for a very fair imitation of it is sent up from Northamptonshire; and the London retail dealers wash the salt well out of the Cambridge butter, and, forming it into rolls, sell it for Epping butter, while a few are more impudent, and sell almost any kind of butter as true Epping.

PRUNING.

From the Genesee Farmer.

A great variety of experiments made in Europe, and by Buel, Kenrick, and others, have been made on the subject of pruning trees, and though the results did not perfectly agree on all points, yet they seem to fully justify the general conclusion that the best time for pruning trees is that period in midsummer in which there appears a cessation of the sap's ascent, and which lasts some three or four weeks. Those who had paid attention to the growth of trees must have remarked that the period of increase is divided in two seasons, during the first of which, or the one most active, the shoots that form fruit, flower, or seed-buds are formed; and the other or later summer's growth is confined to the shoots that produce wood buds only. "After the second growth is completed the effects of the decending sap, in the formation of new bark, is apparent in the healing up of new wounds, in parts of the stem or branches, which now proceeds with more activity than during any other season of the year. Branches pruned off smooth at the stem, though the latter be young, healthy, and containing a perfect pith, before or shortly after the completion of the midsummer's growth, do not produce shoots from the edge of the wounds caused by their removal, which always happens more or less when pruning is performed on free growing trees after the fall of the leaf, and before the full development of the spring shoots and leaves. It is to be observed however that the reproduction of branches from the edge of a wound is greatly assisted by leaving a portion of the branch or shoot, on the parent branch or stem." [Treatise on Planting.]

The end desired to be attained by the operation of pruning must be kept steadily in view, or injury instead of benefit may be the result. If the tree is intended for timber, the leaves and buds that elaborate the sap, and increase the trunk by the formation of an annual circle of new wood, should be kept as far from the root as possible, as in this way only can the greatest quantity of timber be produced. In this case, the trunk should be kept free from branches, the leading shoot should carefully be preserved, and the top kept in a crown like form. Nature must be followed in this respect, and the tall beautiful trunks of our native forest trees will be the result. For fruit, a low branching top, spread and exposed to the sun as widely as can be, is to be preferred; and hence the leading shoot when the tree is at a proper height must be carefully cut out, and the lateral branches cut and pruned with direct reference to this effect. Fruit trees must be pruned frequently, or their tops become woody, close, and the fruit will necessarily prove inferior.

NEW MODE OF BREAKING OXEN.

From the Franklin Farmer.

"The onlyest way to break oxen that I ever saw!"—so exclaimed a countryman the other day, on seeing the operation. Get a strong post, eight feet long by two thick, plant it three and a half in the ground, (well rammed,) round or bevel the upper end, and leave a pin to it or make a mortise and put a strong two-inch pin, six or eight inches long in it. Then get a tough sapling twenty-five feet long; measure off at the small end the usual length of a yoke, and bore the holes for your bows accordingly. Then bore three holes (or more if you choose) four, eight and twelve feet from the other end, of the size of the pin in the top of the post, place it on top of the post, giving the shortest lever first, draw your steers up, let them be young or old, gentle or wild, it makes no difference; yoke them to the end of the pole, but instead of tying their tails together, if you wish to avoid bob-tailed oxen, tie their loins together with a good rope, wrap up their head halters, clear the front, and let them go. Round and round they go with a rush; drunk, drunker still they grow, until, groaning down they drop. For a while they lie panting and looking wild; at length they leap up as if suddenly frightened, rush round again, grow drunk and drop again. Leave them, they will repeat the experiment, until, reeling, they will stop or stand; in a few hours you may lead them around by their halters. Uncouple them from the pole or yoke them to your cart, and drive them where you choose with safety. Any gentleman will be entiled to the above patent for life by paying five dollars to the nearest needy widow, taking her receipt for the same and filing it among his own papers. WM. P. HART.

HUSBANDRY IN CHINA.

Extract from Duhalde.

Among several good regulations made by the same emperor, [Yong. Ching,] he has shewn an uncommon regard for the husbandmen. To encourage them in their labor, he has ordered the governors of all the cities to send him notice every year, of the person of this profession, in their respective districts, who is most remarkable for his application to agriculture; for unblemished reputation; for preserving union in his own family, and peace with his neighbors; for his frugality and aversion to extravagance. Upon the report of the governor, the emperor will advance this wise and diligent husbandman to the degree of a mandarin of the eigth order, and send him patents of an ordinary mandarin; which distinction will entitle him to wear the habit of a mandarin, to visit the governor of the city, to sit in his presence, and drink tea with him. He will be respected all the rest of his days. After his death he will have funeral obsequies suitable to his degree; and his title of honor shall be written in the hall of his ancestors. What emulation must such a reward excite among the husbandmen!

Accordingly we find that they are continually busied about their lands; if they have any time to spare, they go immediately to the mountains to cut wood; to the garden to look to their herbs, or to cut canes, &c. so that they are never idle. The land in China never lies fallow. Generally the same ground produces three crops in a year; first rice; and before it is reaped they sow fitches; and when they are in head, beans or some other grain: thus it goes continually round. They very seldom employ their land for unprofitable uses, such as flower gardens, or fine walks; believing useful things more for the public good, and their own.

The attention of husbandmen, is chiefly employed in the cultivation of rice. They manure their land extremely well; gathering for that purpose, with extraordinary care, all sorts of ordure, both of men and animals, or truck for it wood, herbs, or lineeed oil. This kind of manure, which elsewhere would burn up the plants, is very proper for the lands of China; where they have an art of tempering it with water before they use it. They gather the dung in pails, which they commonly carry covered on their shoulders; and this contributes very much to the cleanness of their cities, whose filth is thus taken away every day.

In the province of *Che-Kyang*, and other places, where they sow rice, they use balls of hogs, or even human hair; which, according to them, gives strength to the land, and makes that grain grow better. For this reason, barbers save the hair which they cut off the heads, and sell for about a halfpenny a pound to such people who carry it away in bags; and you may often see barks loaded with it. When the plant begins to ear, if the land be watered with spring-water, they mix quick-lime with it; saying that it kills worms and insects, destroys weeds, and gives a warmth to the ground, which contributes much to its fertility. By this means the rice fields are so clean, that Navarette, sometimes, walked through them, looking for some small herb; and could never find any; so that he concludes, the rice which is surprisingly tall and fine, draws all the nourishment from the ground.

The husbandman sow their grain at first, without any order; but when it has shot about a foot, or a foot and an half high, they pluck it up by the roots; and making it into a sort of small sheaves, plant it by a line, and checkerwise; to the end, that ears, resting upon each other, may stand more firmly, and resist the winds. But, before the rice is transplanted, they level the land, and make it very smooth, after the following manner; having ploughed the ground three or four times successively, always to the ancles in water, they break the clods with the head of their mattocks; then, by the help of a wooden machine (on which a man stands upright, and guides the buffalo that draws it) they smooth the earth, that the water may be every where of an equal height; insomuch that the plains seem more like vast gardens than open fields.

The mountains in China are all cultivated; but one sees neither hedges nor ditches, nor scarce any tree; so fearful they are of losing an inch of of ground. It is very agreable to behold, in some places, plains three or four leagues in length, surrounded with hills and mountains, cut, from bottom to top, into terraces three or four feet high, and rising one above another, sometimes to the number of twenty or thirty. These mountains are not generally rocky, as those in Europe, the soil being light and porous, and so easy to be cut in several provinces, that one may dig three or four hundred feet without meeting with the rock. When the mountains are rocky, the Chinese loosen the stones, and make little walls of them to support the terraces, they then level the good soil and sow it with grain.

They are still more industrious. Though in some provinces, there are barren and uncultivated mountains, yet the valleys and fields which separate them in a vast number of places, are very fruitful and well cultivated. The husbandman first levels all the unequal places that are capable of culture. He then divides that part of the land, which is on the same level, into plots; and that along the edges of the vallies, which is unequal, into stories, in form of an amphitheatre: and as the rice will not thrive without water, they make reservoirs, at proper distances, and different heights, to catch the rain and the water which descends from the mountains, in order to distribute it equally among their rice-plots; either by letting it run down from the reservoir to the plots below, or causing it to ascend from the lower reservoir to the highest stories.

For this purpose they make use of certain hydraulic engines, which are very simple, both as to their make, and the manner of playing them. It is composed of a chain made of wood resembling a chaplet or pair of beads, strong as it were with a great number of flat boards, six or seven inches square, and placed parallel at equal distances. This chain passes through a square tube or gutter; at the lower end whereof is a smooth cylinder or barrel, whose axis is fixed in the two sides: and to the upper end is fastened a sort of drum, set round with little boards to answer those of the chain, which passes round both it and the cylinder: so that when the drum is turned, the chain turns also; and, consequently, the lower end of the gutter or tube being put into the water, and the drum-end set to the height where the water is to be conveyed, the boards filling exactly the cavity of the tube, must carry up a continual stream so long as the machine is in motion; which is performed in three ways,—1st. With the hand by means of one or two handles applied to the ends of the axis of the drum.—2nd. With the feet by means of certain large wooden pegs, about half a foot long, set round the axle-tree of the drum for that purpose. These pegs have great longish heads, rounded on the outside, for applying the soles of the naked feet; so that one or more men, may with the greatest ease put the engine in motion, either standing or sitting; their hands being employed all the while, the one holding an umbrella, and the other a fan.—3rd. By the assistance of a buffalo, or some other animal made fast to a great wheel, about four yards in diameter, placed horizontally. Round its circumference are fixed a great number of pegs or teeth; which tallying exactly with those in the axle-tree of the drum, turn the machine with a great deal of ease.

When a canal is to be cleansed, which often happens,—it is divided, at convenient distances, by dikes; and every neighboring village, being allotted its share, the peasants immediately appear with their chain-engines, whereby the water is conveyed from one to the other: this labor, though painful, is soon ended, by means of the multitudes of hands. In some parts, as the province of *Fo-Kyen*, the mountains, though not very high, are contiguous, and with scarce any valleys between; yet they are all cultivated by the art which the husbandman have to convey the water from one to the other through pipes made of bamboo.

To this surprising industry of the husbandmen, is owing that great plenty of grain and herbs, that reigns in China above all other regions. Notwithstanding which, the land hardly suffices to support its inhabitants; and one may venture to say, that to live comfortably they have need of a country as large again.

After all, the husbandmen are generally poor people, and have but a small parcel of land each. The usual rule is for the landlord to have one half the crop, and pay all taxes; the husbandman has the other half for his pains.

GRUB WORM.

From the Farmers' Cabinet.

A procrastinating farmer saves the lives of millions of grubs.

It seems to be a law of nature, that population should keep pace with the means of subsistence; and this law appears to be faithfully maintained throughout the animal kingdom, even down to the lowest grade of insects and worms. The grub worm, which is so destructive to Indian corn in the early stages of its growth, was much less numerous and injurious previous to the introduction of red clover. At that period, corn was generally planted where there had not been a sufficient quantity of tender, succulent food, for it to subsist upon in any considerable numbers, and consequently its propagation and support was so slow as not to be observable. But when clover was generally cultivated, and by the most skilful arrangement of the rotation of crops, Indian corn succeeded it when the clover began to run out, the increase of the grub worm keeping pace with the means of subsistance, (for it feeds with avidity on the green, succulent stalks of clover,) propagated to a most alarming extent; and the sod being ploughed down in the spring for corn, and the pasture of the worms being by that means destroyed when the young corn began to vegetate and show itself above ground, the worms following out the law of self-preservation, and from no mischievous propensity, commenced feeding upon it more ravenously, and for some years it was almos doubted whether its culture would not have to be abandoned in some neighborhoods.

During this state of suspense, some observing, reflecting person, who no doubt had taken the trouble to examine into the character, habits and instincts of the grub, discovered that early in autumn it sought retreat some inches below the surface of the earth, and there prepared itself a domicil where it might repose in safety from storms and tempests till the vernal season arrived, and with it its accustomed food.

It was very rationally suggested, that if the sod was ploughed down late in the fall, and the habitations of the enemy turned topsy-turvey, that the walls might be broken in pieces by the winter frost, and that the inhabitants being turned out of doors would perish, and the young corn be preserved from its greatest enemy. This was at first suggested as a *theory*; it was soon put to the test of *practice*; and every farmer knows the benefit that resulted from it. The grub soon became a much less formidable enemy; every one knew how to vanquish it, provided a pretty severe winter came to his aid. But farmers sometimes have treacherous memories as well as other folks, and the enemy having been supposed to have been completely routed, there was a strong propensity felt to resume old habits, and postpone ploughing corn ground till spring again, in accordance with ancient custom; this has often been done, and generally with the same result; the enemy not being entirely exterminated, increases his forces, and proceeds again to the work of destruction.

A few years since, from winter setting in early, or some other cause, very little corn ground was ploughed in the autumn; the following spring the corn suffered severely from the depredations of the grub; but where portions of a field had been turned down in the fall, it furnished the usual protection; this was observable in numerous instances. The succeeding autumn, many farmers having a very short allowance of corn, and smarting under the infliction, went to turning up the ground in good earnest, and overturned the quarters of the enemy without compunction. The consequence was a general exemption from injury; it was pretty well followed out for a year or two afterwards; but last fall many began to relax, and to forget the things that they had suffered, and much corn ground was permitted to remain undisturbed till this spring, and those thus circumstanced are now going on in the old track, that did very well before clover was brought into general cultivation and the sod ploughed down for corn.

Now let us observe and see if the laws of nature have been reversed to accommodate those who neglect fall ploughing.

EGGS.

From the Genesee Farmer.

Almost every body loves good fresh eggs, and with or without glasses or silver spoons, can contrive to eat them; whether boiled or fried, raw or roasted, made into custard with sugar and spices, or swallowed gently with a bordering of old Port, they agree with the palate and stomach; and neatly laid out with fat slices of bacon, they form a repast within the reach of all, and to be despised by none. But though most farmers keep fowls, and *raise* their own eggs, there are many who have not yet learned the difference there is in the richness and flavor of eggs produced by fat and well fed hens, and those from birds that have been half starved through our winters. There will be some difference in the size, but far more in the quality. The yolk of one will be large, fine colored, and of good consistence, and the albumen or white, clear and pure; while the contents of the other will be watery and meager, as though there was not vitality or substance enough in the parent fowl to properly carry out and complete the work that nature had sketched. In order to have good eggs, the hens should be well fed, and also provided during the months they are unable to come at the ground, with a box of earth containing abundance of fine gravel, (if of limestone, so much the better,) that they may be able to grind and prepare for digestion the food they receive. Fowls form no small item in the profits of the small farmer, and few creatures better repay the care and attention they receive. Of eggs, those of the domestic hen are decidedly the best; but those of both ducks and geese may be used for some of the purposes of domestic cookery. Eggs can be kept any length of time, if the air is perfectly excluded, and the place of deposite kept at a low temperature.

FEEDING MILCH COWS.

From the Genesee Farmer.

Natural grass is the first and best of all food for cows; and where this can be obtained in sufficient quantities, nothing further can be desired. Sweet and nutritious, grass gives a richness and flavor to milk, attainable from no other source; and which, milk produced from grains, distiller's wash, or roots, can never equal. Of the grasses, lucerne is considered the best, and the clovers next; and as lucerne cannot with property be considered one of *our* cultivated grasses, perhaps we have nothing in this country that excels white clover for imparting a peculiar richness and even fragrance to milk;

The grasses are best for the cow, when fed green. But the best method of feeding the grass to the animal has been matter of some dispute. The common method of turning the cow into the field occasions the least trouble perhaps, but it is also the most wasteful; and where economy is to be consulted, some other method of feeding may be found preferable. Curwen found by experience that three acres of good grass, cut and fed to the cows, supplied 30 milch cows with 28 lbs. each, during 200 days. Their other food was hay, of which they consumed little, and their health was excellent, and their milk superior. Mr. Curwen observes, "that to have supplied a similar number of cows with a like quantity for the same period, would, in the usual way of management, have required 75 acres of land for its production. And to have grazed such a number of cows at liberty, that length of time, must, it is obvious, have taken a very considerable number of acres.

If such is the saving that may be made by substituting labor for land in feeding cows, we think the subject well worthy the attention of dairy-men, and milk-men, especially in the vicinity of our cities. If by employing the labor of one man through the summer months in carrying the grass to the cows, instead of allowing them to gather or trample it down for themselves, twenty cows could be kept on land that now supports only ten, we think there can be no question as to the profit. Only the best and sweetest grasses can be used for carrying; but where meadows of this kind exist, and by proper attention to draining, manuring, and seeding, all may be made such, the quantity of grass that may be taken from them by successive cuttings is great. Because in our meadows, the grass standing till nearly ripe before mowing, does not spring up at once, it by no means follows that when cut green, while the circulation is active and the roots vigorous, that such would not be the case. Indeed the rapidity with which the grasses spring up in our rich pastures after being fed down by cattle, is sufficient proof of what nature is able to accomplish, when the efforts are not checked, but aided by the skill of the husbandman.

ON THE PRESERVATION OF THE HEALTH OF NEGROES.

From the American Farmer.

It is a well known fact to physicians of the southern states, that "negroes, though less liable to autumnal diseases than the whites, yet suffer *much more* severely from winter epidemics than they do." The negroes, for instance, will escape the bilious affections of the hot season, while the white inhabitants are falling victims; but, when winter takes place, the blacks are swept off, while their masters' families are secured.

There would be, in the extraordinary nature of the fact, a sufficient incentive to the investigation of the cause or causes of this difference: but there are motives of a still more urgent nature, that demand an attempt at discovering the cause and preventing the effects. The blacks constitute, either absolutely or instrumentally, the wealth of our southern states. If a planter, as it often happens, is deprived by sickness of the labor of one third, or one half of his negroes, it becomes a loss of no small magnitude. If we should then succeed in ascertaining the cause, and pointing out a preventive, we shall not only have gratified curiosity, and served the interests of the planter, but also feel the approbation of our own mind in having aided the cause of humanity.

We have seen in our last number, "On Heat and Clothing," that *white* and *polished* surfaces let off heat *slowly;* whereas *black* or *rough* surfaces, radiate it *freely*. This is admitted as a fact in chemistry and physiology. We know that liquids cool soonest in *dark* vessels, and retain their heat longest in *bright* ones. We also know that animals in polar regions, which are of a *dark* color in the summer, change to *white* in the winter; nature, no doubt, intending by the change of color as much as by the thickening of their coat, to secure them against the severity of the cold. The negro on the other hand, was designed for the sultry regions of the torrid zone. His surface is therefore adapted to the ready escapement of internal heat. Hence, when transplanted to colder latitudes, he and his posterity are less capable of resisting external cold, because they are less capable of retaining their internal heat. It is also a fact well known to physiologists, that the body of a negro is, *cæteris paribus*, several degrees cooler than that of a white person. We known too, that blacks uniformly show themselves fonder of the fire than whites.

That they are then *really* more chilly, we cannot doubt, after taking into view all the circumstances just noticed. It therefore necessarily follows, that they are more liable to diseases brought on by the cold of winter, than white persons. They are likewise more subject to disease on account of their great exposure to wet and inclement weather.

In the enumeration of the causes of the greater liability of negroes to winter epidemics, we perceive an immediate answer to the question, "how can the health of slaves be best preserved ?" We see that if they had a *white* skin, it would prove a security to them: but as we cannot "wash the Ethiop white," we must use such other means as may prevent the free escapement of their heat. They ought in the first place, to wear *woollens* next their skin, instead of linen and cotton. Long woollen shirts would retain their heat, equalize the excitement, and secure them against the effects of wet work and rainy weather. These shirts should be *white*, for reasons too obvious to need repetition. They should also be frequently washed, as clothing loses very much of its capacity for retaining heat, when filled with perspiration, &c. The truth of this we experience every time we change our soiled clothes for clean ones; for an increased and permanent glow of heat is the consequence of putting on clean clothes. When wet, negroes should dry by a good fire. They should also be allowed to sleep by a fire, if convenient; the *out* laborers especially.

By attending to this regimen, we feel no hesitation in saying that a planter will greatly secure the health of his slaves; and we shall conclude with remarking, that it now lies with him to determine, as soon as he may see proper, whether the trouble and expense of this preventive is rather to be chosen than the risk of losing much by the sickness or death of his negroes.

FRANKLIN.

DECLINE OF SOUTHERN COMMERCE.

From the Journal of Commerce.

The report of a committee of the Southern Convention, which was held last April, in Charleston, furnishes the following table, showing the comparative progress of commerce at the north and south :—

"The statistics of the United States enable us to present the following statements exhibiting at one view the rise, progress, and decay of southern commerce. They are extracted from one of the documents formerly published by this convention, and show that the time was, when the people of the south were the largest importers in the country.

"In 1769, the value of the imports of the several colonies was as follows :—

Of Virginia, - - -	£851,140	sterling
New England states	561,000	do.
New York, - - -	189,000	do.
Pennsylvania, - -	400,000	do.
South Carolina, - -	555,000	do.

"The exports were in about the same proportion: Virginia exporting nearly four times as much as New York ; and South Carolina nearly twice as much as New York and Pennsylvania together ; and five times as much as all the New England states united.

"The same relative proportion of imports is preserved until the adoption of the federal constitution, when we find them to be in the year 1791 as follows:

"Of New York, - - -	$3,222,000
Virginia, - - - -	2,486,000
South Carolina, - - -	1,520,000

"There are no data to show the imports into the several states from the year 1791 to 1820; but the general fact may be assumed, that the import trade of New York and other northern states has been constantly progressing, while that of Virginia and South Carolina has as regularly diminished. From 1821 to the present time, we have sufficient data, and they exhibit the following as the state of the import trade :

	New York.	*Virginia.*	*S. Carolina.*
1821	$23,000,000	$1,078,000	$3,000,000
1822	35,000,000	864,000	2,000,000
1823	29,000,000	681,000	2,000,000
1824	36,000,000	639,000	2,400,000
1825	49,000,000	553,000	2,150,000
1827	39,000,000	431,000	1,800,000
1829	43,000,000	375,000	1,240,000
1832	57,000,000	550,000	1,213,000

"Thus, the import trade of New York has gradually increased from £189,000 sterling, about $840,000, in the year 1769, and from about three millions of dollars in 1791, to the enormous sum in 1832, of fifty-seven millions of dollars! While Virginia has fallen off in her import trade, from two and a half millions of dollars, in 1791, to $375,000 in 1829, and $550,000 in 1832, not a great deal more than the freight of half a dozen ships!

"From these calculations, a few curious facts appear. The imports of New York were, in 1832, seventy times as great as they were in 1760, and nearly twenty times more than they were in 1791. Virginia, on the other hand, imported, in 1829, about one-eleventh of what she did in 1769, and about one-seventh of what she did in 1791. In a period, too, of eight years, the aggregate imports of New York amounted to three hundred and eleven millions of dollars ; those of South Carolina to about sixteen millions, and those of Virginia to about five millions! New York imported, therefore, in 1832, eleven times as much as Virginia did in eight years preceding, and nearly four times as much as South Carolina did in eight years preceding. Again, New York imported in one year (1832) nearly fifty times as much as South Carolina in the same year, and about 110 times as much as Virginia."

REMARKS ON THE VEGETABLE KINGDOM.

Delivered before the Cumberland Agricultural Society, April 12th, 1839.

By William B. Smith, M. D.

[Communicated for publication in the Farmers' Register.]

I propose making some general remarks on the vegetable kingdom, and will give an outline or synopsis of botany, stripped of its cabalistical covering. I shall do this in "simplicity and truth," endeavoring to comprise much in a short compass; and hope to be comprehensive without being considered technical.

First, I shall give a short history of plants; secondly, vegetable physiology; thirdly, the analogy between plants and animals; and fourthly, conclude with remarks on the fossil remains of vegetables.

The seeds.—The seeds of plants are of sexual origin, and in many respects correspond with the eggs of animals; they are umbilically attached to the parent, and when ripe, drop in a dormant state, and, under favorable circumstances, remain for a length of time, uninjured. They contain a vital principle or embryo, and, when fully developed, are an exact likeness of the parent. Seeds have one or more coverings for the purpose of giving them form and preservation, until the time arrives for germination. They are wonderfully made, and contain more mystery than has been explained by the wisest philosopher that ever lived. An acorn is said to contain in its little shell, the rudiments of every member of the largest oak. If this opinion be correct, a germ is not a unit, but contains in its compass a plurality or multiplicity of its kind, with reproductive or procreative powers; and may be considered multiparous, capable of bringing forth many at a birth. An acorn, therefore, contains the rudiments of many thousand young buds; some of which require ages for their full developement. The oak attains the age of one thousand years; during this period it is annually bringing into being young trees. Every bud is a distinct tree, and when evolved, will be like the parent. In a stalk of corn, each off-set may be considered a multiparous shoot, producing its like; and, with a few exceptions, this is the case with regard to the whole vegetable race. We observe in seeds, a living principle, in a minute organic germ, capable of wonderful developement. When seeds are placed in the soil, having a due portion of heat and moisture, they swell, become soft and mucilaginous, are enlarged, and in a short time, burst asunder their membranes; the little root is seen descending in the earth, in search of humid, gaseous, elemental food; and becomes permanently fixed. Soon after this, the ascending sprout climbs upward, peeps out of darkness, and is brought into light and life; expanding and enlarging until there is a full developement of all its parts. The young germ or embryo, is in contact with one or more lobes of nutritive matter, yielding food for the infant plant, until its tender root is sufficiently large and strong, to go in search of aliment. This nutritive or farinaceous matter, is entirely absorbed by the plant, during the first period of its growth.

The form, size and color of seeds, are so various, that I shall not attempt to describe them; some are extremely small, others large, having a great variety of form, size and color. Many are found on the spot where they grew, and become food for man and other animals. Some are driven by currents of water in various directions; while others take wing, and fly from one situation to another. The great aerial ocean, that surrounds this earth, is filled with minute seeds, which are perhaps wafted from continent to continent; those that are heavy become saturated with water, return to the earth, and as soon as they find a matrix, spring into life, run their course and rot. If large trunks of mahogany, palm nuts, &c., are driven from the gulf of Mexico, by marine currents, to the coasts of Ireland and Norway, I see no cause to prevent the finer downy seeds from being wafted on the wings of the wind across the Atlantic Ocean. There is a singular circumstance in the history of seeds, viz., they are said to remain for ages, in a state of preservation; the different kinds of plants that occasionally visit us, favor such an opinion. In our forest plant beds, we frequently observe a new set of plants, differing in genera and species from those in the neighborhood; and I think it probable forest seeds lie dormant under the earth and leaves, retaining their vitality, and may be made to germinate by exposing them to the action of light and air. Seeds are said by botanists to be the essence of the fruit of vegetables. Linnæus denominates seeds to be the deciduous parts of the plants, containing the rudiments of new organization, fertilized by the male dust.

Plants are furnished with one seed, or with two, three, four, five, six or many: the fecundity of plants is often astonishing. A single plant of tobacco, is said to produce 500,000 seeds; and a single stalk of spleen-wort one million. If these two plants could multiply and beget their like unmolested and undiminished for twenty years, and every plant during that period retain its organization entire, so that there could be a full evolution and developement of every plant; a mass of tobacco and spleen-wort, in all probability, would be formed, equal in bulk to this earth. This may be considered a novel opinion; but wise philosophers have said that a single herring, if suffered to spawn and multiply, under favorable circumstances, would form a mass as large as this earth in fifteen years.

The root.—The root is the first part produced by a germinating embryo; and its presence is necessary to most plants. Some plants feed from the atmosphere. The dodder, or love vine, entwines various grasses and weeds, and would seem to exist without roots; it is, however, propagated from seeds deposited in the earth, and as soon as the plant begins to feed from the atmosphere, the communication between the earth and dodder is cut off, and the root dies. When the primitive root enters the soil, it gives off small fibres from the end and along its sides; these end and side roots give off branches in like manner, until by repeated division and sub-division they are all expanded and enlarged. They serve to fix and hold plants to the soil from which they imbibe nourishment through their porous and elementary tubes. A root is semi-annual, annual, biennial, and perennial. Semi-annual and annual plants live but one season, as many kinds of grass, oats, &c. Biennial roots survive one winter, as clover, wheat, rye, &c., and perish the following summer after perfecting their seeds. Perennial roots are such as remain and produce blossoms and seeds for many years. The body of a root is denominated the *cordex*, and the fibrous part the *radicular*. It is highly necessary that we should be well acquainted with the various kinds of roots, for they differ very widely in their nature and functions. Fibrous roots, particularly those near the surface, require a constant accession of moisture, while those of the more fleshy kind most powerfully resist drought, and are reservoirs of the vital energies of plants.

Roots are distinguished as follows: 1st, A fibrous root, as in many kinds of grasses and grain. 2nd, A creeping root, as in weeds. 3rd, A spindle-shaped, or tap root, as in cotton, carrots, and radish. 4th, A stumped root, as in many kinds of plants. 5th, A tuberous root, or knobbed root, as in the potato. 6th, A bulbous root; this is a subterraneous bud, being solid, as in the crocus, ternicate, as in the onion, or scaly, as in the lily. 7th, A granulated root. 8th, The extended root, as in forest trees. There are some remarkable circumstances recorded respecting the longevity of roots. It is well authenticated that the roots of some trees, when grubbed up, were found fresh and sound, though the tree had been felled many years. The larger roots of plants, trees, &c., have a triple office to perform, viz., they act as supporters and feeders, and give off stems; whereas the smaller roots, are most actively employed in supporting the plant with nutritive matter. The ends of young roots are extremely soft, tender and delicate, and cannot bear the action of light and air; hence their downward direction at first, but as soon as they gain strength, they change this direction, and climb up near the surface in order to breathe. They travel a considerable distance in search of food; the Indian corn extends its roots to the distance of ten or twelve feet; and forest trees, such as the oak, poplar and pine, run out their roots to the distance of 75 yards. All roots are said to be choice in their selection of food, for they are known to creep aside and avoid bad earth, in order to approach good. Whoever has attended, in the slightest degree, to the developement of plants, must have observed that as soon as the little germ commences its course in life, it has two opposite directions; one perpendicularly upward, and the other immediately downward. There is a line of demarkation between the ascending and descending members which seems peculiarly organized. Whatever enlargement, division or sub-division, takes place in the first stage of life, below this line or point, are roots, which descend; and whatever is above, are shoots and sprouts, and rise into the air. This point bears the seed leaves or *cotyledons*, and is the crown of the root, and base of the stem, called radical plate or life-knot, which is of the greatest importance in the economy of vegetables; for all the other members of the plant may be destroyed or separated without loss of life, if the radical plate, life-knot or collet, be preserved. If divided in many parts each will become perfect plants. It is a homogeneous substance, and has the property of giving off many individual plants, and is properly speaking an assemblage of vital buds, to be developed in the order of their position. The oldest central bud is the largest, and generally puts forth first, and the others follow in regular succession, which may with propriety be called off-sets. The life-knot or radical plate of a turnip is found on the top; that of an onion at the bottom. Planters and gardeners should be particular, and not place the life-knot or radical plate too far below the surface of the earth; if they do, atmospheric air is excluded, and the plant either dwindles or dies. In transplanting trees, the life-knot is often placed too deep; the consequence is, that the tree remains stationary for a length of time, and if the buds shoot, they are diseased, grow slowly, and the whole tree is imperfectly developed. In transplanting tobacco, cabbage, &c., we are apt to plant deep in order to secure moisture to the root; such plants live and are stationary for six weeks or two months, and the result is a small unhealthy crop. Some roots have buds in abundance, and produce stems; and we may say in truth, that both roots and stems contain buds.

The stem or trunk.—The stem or trunk, is that body which is above ground, and serves to support and elevate branches, leaves, fructification, and fruit. The stem assumes many forms and characters, as to bulk, structure, position, place and duration; varying in size, from the smallest thread, to a trunk of ten feet in diameter. The structure of stems are hollow or solid, jointed or simple, single or numerous. In position, they are erect, inclining, prostrate, &c.; they rise in the air, or creep on the surface, and are succulent or woody. The form of stems are various, being round, flat, angular, square, &c. Some have but few branches, as the reed, others give off many and divide until we observe almost a countless number from a single stock. The stem is composed of pith, wood, and bark; the pith generally occupies the centre of the stem, and constitutes the principal part of the bulk of the seedling, and of every young shoot: it is soft and spongy, and as it increases in size, diminishes in volume, and ultimately becomes ligneous matter: this is the case with woody trunks. The layers of wood are supposed to be formed from the pith, and the diameters of trunks are annually enlarged by concentric layers; the pith being in the centre of the ligneous circles. These annual circles of wood are composed of parallel fibres longitudinally arranged, extending from the root or life-knot, to the summit of the trunk, and throughout every branch of the spreading tree. The concentric layers or circles are distinct from each other, and are connected by inspissated sap, and cellular tissue. The ages of trees may be ascertained by counting the number of rings from the pith to the bark. After trees have passed their usual age, they begin to decay; the oldest and first formed circles, next the pith, decay, and so on until the tree becomes a hollow shell, and nothing remains but the sap-wood next the bark.

The bark.—The tender plant, rises from the earth with its exquisitely delicate coat of bark; which remains as an external covering, enlarging as the tree increases in size; some plants, however, shed their bark periodically. The inner bark is formed into white-wood, or sap-wood annually, and another coat of bark formed from inspissated sap. These new layers of bark and wood are the principal channels for the circulation of sap. The bark or covering of trees corresponds pretty much with the skin of animals, having an external, middle, and inner coat or covering. Branches are subdivisions of the trunk, and every bud they contain is a young tree.

The leaves.—The leaves of plants, are very important organs; and yet it would seem, they are not absolutely necessary to all plants; as the stem and stalk in some few instances perform the office of leaves. They are decidedly organized, and so formed, as to present a large surface to the action of light and air. Next to the flowers, they are the grand ornaments of plants, and from their number and position must perform some very important office in the economy of vegetables. Leaves are supposed to be the organs of respiration, or in other words, they are the lungs of vegetables. They contribute to the growth of plants, having inhaling and exhaling vessels. Vegetables take in atmospheric air, and give out oxygen gas; the reverse takes place with respect to the animal kingdom. In animal respiration, oxygen gas is absorbed, and it would seem by this wise provision of nature, that a just balance is kept up between the two kingdoms. Leaves produce a constant flow of sap upwards, in consequence of their exhaling and inhaling functions; hence it is that plants die if robbed of leaves; their health and vigor depending pretty much on these important appendages. The inhaling leaf vessels not only take in atmospheric air, but they imbibe large quantities of water, and modern naturalists are decidedly of the opinion, that the hydraulic action of leaves are their chief office. Leaves have a great variety of form, and many appendages which I consider unimportant, except to the botanists, and will pass on the

Flower and fructification.—The parts of the flower are the *calyx*, *corolla*, *stamens*, *disk*, *nectarium*, *pistillum* and *receptacle*. The *calyx* is the external covering or investment of the flower; in which it sits, and serves to defend the more delicate members of the flower. The *coralla* is the beautiful brilliant assemblage of variegated and highly colored leaves, or petals, which stand immediately within the calyx. The *stamen* is the male part of the flower, situated in the corolla, and consists of three members; the *filament*, the *anther* on its summit, and the *pollen*, or dust discharged from the anther. The *pollen* is formed in the *anther*, by a process called secretion: it contains the fecundating influence or principle, without the contact of which seeds, already formed in the *ovarium*, would be abortive. This dust, when seen by a microscope, appears globular, oval, square, &c. The dispersion of the *pollen* is caused by the spontaneous action of the *anthers*, and facilitated by the visits of insects. The *stamen* is of short duration, and disappears soon after the *pollen* is discharged. The *disk* is at the base of the stamen, connected with the seed vessel, and forms a vacant space. The *pistillum*, occupies the centre of the flower; it is the female or reproductive part of the plant; and like the *anther*, consists of three divisions; viz. the seed-vessel or *ovarium*, the *style* and the *stigma*. The *ovarium* is differently constructed, and assumes various shapes. The *style* is that portion of the *pistillum* which serves to elevate the *stigma*, and is usually seated on the topmost part of the *ovarium*, and is of various lengths; it is a cylindrical tube for the purpose of admitting the descent of the *pollen* shed from the *anthers*. Sometimes the *style* is wanting; when this is the case, the *stigma* is in contact with the *ovarium*. As soon as the *ovarium* becomes impregnated, the *style* dies; some plants have one *style*, some two or more. The *style* and *stigma*, are very delicate members of flowers, being easily injured by cold winds and frosts. The *stigma* is found on the summit of the *style*, if the latter be present; if not, on the apex or crown of the *ovarium*. It is the only part of the plant that has no cuticle, and, where perfect, is covered with a lymph to catch and dissolve the *pollen* shed from the *anthers*. In this delicate mucilage, the *pollen* undergoes some kind of change, or solution, preparatory to its descent into uterus. This seems to be the course in which the sexual powers of plants are united and consummated. The *receptacle* is that part on which all the members of flowers are seated, and may be called the flower stem.

We have traced the plant from the seed, through its various evolutions, and have given a short account of its members, organs and woody structure; which may with propriety be called the solid parts of vegetables. We propose now to make some remarks on the fluids and tissues of plants.

The various matters affording food for plants, are changed by the organization of the vegetable; from which their results a fluid generally distributed and known by the name of sap. This juice, when conveyed into the several parts of the plant, receives an infinity of modifications, and forms the several fluids which are separated and afforded by their various organs.

The fluids consist of aqueous and gaseous principles, extracted from the earth and atmosphere. These principles are taken up by the plant and elaborated into sap, mucilage, gum, glue, oil, resin, sugar and various acid and saline secretions. Plants have numerous vessels, for the purpose of transmitting these fluids; they are found pervading every part of the root, stem, branches, leaves, flowers, fructification and fruit: indeed these vessels, as numerous as they are in large trees, may be found in the young tender plant, and even in the embryo, long before germination. The circulation then commences with the seed, and continues through its evolution and growth, down to the closing period of life. The vessels common to plants, are inhaling and exhaling vessels, spiral tubes, and longitudinal ducts. Vessels are composed of circular fibres, so delicate and elastic, that they are capable of contraction and relaxation. This alternate contraction and relaxation of the circular fibres, together with capillary attraction and heat, causes the fluids of plants to circulate through their numerous vessels; which divide and sub-divide into an infinite number of branches and ramifications, until every part of the plant is supplied with fluid matter. The cellular tissue, or membrane, is found in every part of plants, binding their structure, giving them form, and may be considered a bond of union; tying not only every woody fibre to its fellow, but linking together there, in one solid mass, all their various parts. The cellular tissue, has innumerable minute cells, varying in form and size, slightly attached to each other; these cells attract and absorb moisture and gaseous matters, from the atmosphere and earth, and after elaborating the elemantary principles, they go the round of circulation, and are formed into sap, oil, mucilage, &c. The delicate pellicle or skin of the cells of this membranous tissue in the lower order of vegetation is mucilaginous; in the higher orders, they become ligneous, and constitute what is called wood or timber. As all plants are of rudimental origin, it is natural to conclude that the cellular membrane, vascular membrane, and woody membrane or tissues, are co-eval with plants, which "grow with their growth, and strengthen with their strength." These three elementary organs, viz: the cellular, vascular and woody tissues, when united, form a bond of union, and by their wonderful inosculations and ramifications, pervade the whole plant; giving to every part, its organic structure, form and comeliness.

Plants may be compared to animals; having their solid parts analogous to bones, cartilages, muscles and tendons: the fluids of the vegetable kingdom may be compared to the blood of animals; with this difference, that the latter is propelled through arteries, by the muscular power of the heart, and sap, we have reason to believe is pushed forward by the expansive power of heat and capillary attraction. Blood, after going the round of circulation, is returned by veins, except that part washed off, and arrested by a number of glands, a process called secretion. This we believe is pretty much the case with the sap of vegetables; for we know secreted fluids are formed from sap, and after supplying every part of the the plant with fluid matter, it returns and descends to the roots. The blood is formed from well digested food, this is the case with regard to sap; so that vegetables are analogous to animals, both kingdoms being dependent on the earth and atmosphere for subsistence. The highest link in the vegetable scale of existence, is perhaps but one remove from the lowest link in the animal kingdom. Vegetables, have roots for their digestive organs, trunks for their support, branches for their extremities, leaves for their lungs, bark for their skin, woody fibres for their bones, cartilages, muscles and tendons, spiral vessels and ducts for their arteries and veins, and sap for their blood. They have, also, male and female organs of generation, and fruit and seed as their offspring. The growth of vegetables depends on various decomposition; which evolve a number of gasses that are absorbed by the plant, and elaborated into sap, mucilage, oil, &c. Like animals, they cannot live without food and drink; like animals, they feed upon air, water, animal and vegetable productions. The rapid or slow growth of vegetables, depend on rapid or slow decomposition; for nothing can exist except it be from something which had previously perished; composition and decomposition are continually taking place upon the earth, and without this provision in nature, the vegetable and animal kingdoms would, in a short time, become extinct.

(To be continued.)

THE "MAMMOTH" SILK-WORM EGGS; AND THE GROUNDS OF CHOICE AMONG DIFFERENT VARIETIES.

The "mammoth silk-worms" have recently been much puffed in newspaper paragraphs and advertisements; and these recommendations have been received by the continually humbugged agricultural public, with the degree of respect and confidence which is usually given to all who offer "mammoth" seeds or plants, or either vegetables or animals which, by greater size, and supposed prolific power, are *promised* to produce more profitable results than any known before. If the recommendations of the "mammoth silk-worms" eggs had been limited merely and truly to superior size, the subject would not have needed remark. But when they were offered for sale for the purpose of raising second crops of worms from, in the same season, and were actually engaged by many persons under this delusion, at $70 to $80 the ounce, it was time to try to save to some of our readers at least, the money which they might otherwise throw away in misdirected efforts in the important business of silk-culture. With this view, as well as in answer to special inquiries of correspondents, the following remarks, in substance, were prepared for the last sheet of the May number; but could not be inserted, for want of room at the closing.

In the first place we deny totally the main ground of the reputed value of the "mammoth" silk-worms eggs, which is, that they will hatch more than once in one season; and but for this opinion, certainly no one would have paid any thing like $80 the ounce for eggs of 1839. It will not be expected of us to prove a negative proposition; and if this assertion is denied by the advocates of the mammoth variety, it will be for them to exhibit proof that it is truly a "two-crop" kind. That, we confidently believe, cannot be done, and without it, the only remaining recommendation will be that of superior size, which will presently be examined.

We had before believed—and since have been assured by the testimony of L. Y. Atkins, esq. in a previous page—that the eggs of none of the ordinary kinds of worms could be relied on to hatch a second time in the same season; and that the only known kind which can be trusted to, is the small "two-crop white" variety of this country, and which, though a four-cast worm, seems in all other respects to be the same with the small worm of "three-casts" described and recommended by Dandolo. We, as well as Mr. Atkins, have known eggs of the common sized worms to hatch soon after being laid; but such hatching is not certain to occur at all, and never but to a very limited extent. Such *may be* the case with a like small proportion of the "mammoth" eggs—but even that has not been *warranted* in plain terms; and until it is proved to the contrary, we must consider that these stand on no better ground, for second hatchings, than the ordinary kinds.

The repetition of hatching which has become a fixed quality in the "two-crop white" silk-worm, and in other kinds known in tropical climates, is doubtless caused by the long continued action of warmth. In Bengal it is said that there are worms which produce ten or more successive generations in a year; and it seems from Dr. Perrine's information (page 351) that a similar result has already been produced in Cuba. The climate of Virginia is sufficient to make the common worms exhibit a tendency to become a two-crop kind; and we doubt not but such may be produced here, and the quality of repetition be made permanent, in a few years, by rearing from the few eggs which hatch in the same season they are laid. We are now conducting such an experiment with the eggs of a single moth, which alone have hatched out of the laying of 500 females.

We presume that the "mammoth" silk-worms are of the same kind, with some slight change, with the "large silk-worm of four casts" or moultings, described by Dandolo, and to which he objects on several sufficient grounds. Of this kind 150 cocoons weighed as much as 360 of the common kind. Of the "mammoth" cocoons made this season in Richmond, it took 190 to weigh a pound, and a pound of good common cocoons raised here, taken as they come, will count about 300, or perhaps 250, if the best be selected. But whether the mammoth worms and the large worms described by Dandolo are the same, or not, is not important; since the peculiarities, and advantages and disadvantages, of all large worms must be of the same general character. It will not be questioned but that all the larger varieties feed for a longer time, and spin coarser silk than the smaller; and these constitute the main objections urged by Dandolo. He states of the large kind, that their silk is less pure, (or loses more in manufacturing) than that of the common kind of worms, and coarser by nearly 20 per cent. Of course, it would command less price, even if not rejected by the manufacturers for its unusual coarseness. The worms also are several days longer feeding, (under like treatment,) and thus require more time, more labor and expense, and are at more risk. On these general and theoretical grounds alone, we should consider any unusually large kind of silk-worms as the least profitable that could be chosen for culture. But in addition, we have the confirmation, and still more extended objections of a practical experienced and judicious silk-culturist, which will be given below.

There is, however, one, and only one, claim of superiority, which can be truly made for the largest over the common sized varieties. This is, that the weight of food, necessarily consumed for producing the same weight of silk, is rather less for the former than the latter. The comparative quantities as stated by Dandolo, are 18¾ lbs. of leaves, consumed by the larger, and 20¾ by the smaller worms, to produce 1½ lbs. of cocoons. This small difference, if known by the advocates of the mammoth varieties, has been studiously kept by them out of sight—they contenting themselves with claiming large products, in general terms, without stating the amount. Dandolo seems to think that the difference of purity in the two kinds of silk, (or difference of waste in manufacturing,) is caused by, and is not more than compensated by this small saving of food—leaving the other objections out of the estimate.

We think that some of the ordinary kinds of worms, (or what are called the "six-weeks" kinds at the north, but which usually require only from 25 to 28 days' feeding in Virginia,) are the best for general and regular culture. Of these there are many varieties, or shades of difference, and we know not, from experience, which is best. But as our opinion on this point may be expected, when objecting to other varieties, however little the opinion may be worth, we will say, that, with our present imperfect lights, we should prefer the gray silk-worm, with cocoons generally orange; because its product is equal to any, except for the cocoon not being white, and because it seems uncommonly hardy, judging from the general success in rearing this spring, by many different persons, under every variety of exposure, and of injudicious and bad treatment. Judging from report, we should also consider the "pea-nut silk-worm" of the northern states as a valuable variety. But of this we have no practical experience, except in a very small rearing commenced (for comparative experiment) as late as the 18th inst.; and from this we have as yet only learned that the gray worms were larger than the pea-nut, by 50 per cent., at five days old. Hence we would infer that the latter is of size considerably below that of the usual kinds, and which would be as objectionable as being much larger than usual.

If the ordinary or "six-weeks" worms were neither better nor worse than the "mammoth," or any other longer or shorter-lived variety, there would still be a sufficient reason for preferring the former, in the fact that to this kind apply the precise and valuable descriptions and instructions of Dandolo. There is no kind of culture in which the best methods of practice, and the means for accommodation, have been so carefully studied, and elaborately and minutely laid down, by a judicious and rigid course of scientific and practical experiments, as has been done by Dandolo in regard to silk-culture; and the *statistics* of silk-worms which he has furnished—and which have been ascertained by him as an accurate philosophical experimentalist, as well as a very successful practical culturist—offer to the novice a body of information that cannot be too highly appreciated. The better climate of our country, and other superior advantages of the culturist in Virginia over those of France and Italy, may permit him to dispense with many of Dandolo's directions and precautions. Nevertheless, his descriptions of appearances, his facts, his estimates, and his arithmetical statements, are all valuable for reference, and for daily information and instruction. And all these apply to the varieties of silk-worms of ordinary size and duration of age, &c., and would be more or less inapplicable to all "mammoth" varieties. This objection also applies as much to smaller sized varieties; and we should thereupon reject even the "two-crop white" kind, but for the peculiar circumstances of this country at this time, which make it very desirable to secure a double reproduction of eggs, the more rapidly to supply the existing demand. Also, to guard against possible losses of eggs, or of hatchings of worms, it will be well for every culturist to have a portion of his stock of this, or some other two-crop kind.

The recent high appreciation of the "mammoth" silk-worm, is owing to the remarkable prevailing disposition in this country to believe that large-sized individual products are also more abundant in average or general products. Most persons scarcely need the proofs or persuasion of a salesman's advertisements or assertion, but, of themselves, readily jump to the conclusion, that a large sized variety of corn or of wheat, or many ears to the stalk, or of grains to the ear, will necessarily yield more bushels to the acre; and that large varieties of domestic animals will yield more meat for the food they consume. There *may be* a greater or less production from any larger or smaller variety, of vegetable or annual; but it will not depend upon mere difference of size in the individual, but upon its fitness or unfitness for its new position and treatment. But *merely* an increase of size to considerable extent, without greater general product in proportion to the cost of support, will always be disadvantageous; became the previous accommodations for, and means of operating with, the usual smaller sized products, will be less suitable to the larger. If there were offered for sale a breed of sheep as large as horses, and of cows as large as elephants, there would be no inducement to buy and propagate them, if no more wool, milk, or meat, would be obtained from them than the common smaller kinds, on the same amount of land or grass. Nor will the fanciers of large corn and wheat and other vegetable products gain any thing from varieties as enormous in size as the : hopes can reach, unless they can also secure a greater product in bushels from the acre, than from the common kinds. This greater general product, however, the humbugged public always expect to obtain, and always have been duped and disappointed in, when led to expect it from large sized varieties. So, as we infer, of the mammoth silkworm; and even if it were true (as it is not)—that the silk is as good—and the culture as cheap, (which it is not,) still we cannot conceive a reason why it should be preferable to other kinds of common size. But if our reasoning should fail to convince the fanciers of mammoth cocoons, among our readers, (as we presume it will,) we have only to wish them all possible success in the pursuit they prefer; and that they may be able to find cocoons as large as oranges, and to buy the eggs at $10 the dozen, (which would of course insure the demand for them,) and also salesmen who will promise them every possible advantage and profit therefrom, that can be desired or conceived.

There is, however, a much more important ground for choice among silk-worms' eggs, than merely the *kind*—and that is the source whence they are procured, and the treatment and condition of the worms which produced them. It is of the utmost importance that the parent stock should have been healthy, to produce a healthy and vigorous progeny. In our very limited range of observation and practical information on this head, we have known or heard of worms of a particular parcel of eggs becoming diseased, and turning out very badly, when others of another stock did well, at the same time, or under the like management at a different time. The northern raised eggs hatched and fed near this place, this season, have in the general, brought worms manifestly less healthy and vigorous, than the southern. An intelligent and observant experimental feeder in another part of the country, from whom we have have just received a letter, has come to precisely the same conclusion. He say, that "from my own observations, and what I know from others, eggs raised in the south have a decided preference. The worms are much more healthy."

Further—the mixture, from carelessness, of the eggs of different kinds of worms, or of variously crossed varieties, even if every one separately were good enough, is enough to make the whole parcel worthless, and of more plague than profit to the buyer. Even when one variety is kept unadulterated by any mixture of another, it can only be kept uniform in character and qualities, by a careful selection of breeders and of eggs. If a race could be thus obtained of character uniform in all respects, that uniformity alone would make the stock more valuable than any now known.

COMPARATIVE WEIGHTS OF COCOONS OF DIFFERENT VARIETIES OF SILK-WORMS.

To the Editor of the Farmers' Register.

Stafford, June 15th, 1839.

I am highly gratified at the result of your first experiment in the culture of silk. I consider it very encouraging. My worms have also done very well. The cocoons were generally firm and weigh well.

My main object in writing you now, is to state some facts on the point on which you intend hereafter to give an opinion.

I am glad to find you have come to the same conclusion that I have (though I know not by what inducements,) relative to the comparative value of the large and small varieties of the silkworm. I reared this season five varieties, viz., "two-crop," "pea-nut," "mammoth yellow," and two other varieties produced by cross fecundation, always using either the male or female of the "two-crop."

Two hundred and ninety-seven of the cocoons of the "mammoth yellow" taken without selection, weigh a pound; 326 of the "pea-nut;" 360 of the "two-crop;" and 400 of each of the varieties produced by cross fecundation. The floss was taken off previous to weighing. While the cocoons of the "mammoth yellow" are full 60 per cent. larger than those of the "two-crop" or of the "pea-nut," they have the advantage in weight in one case only 9 per cent., and in the other only 21 per cent. One thousand of the cocoons of the "mammoth yellow" furnish an ounce and a quarter of floss, while the same number of the "two-crop" give less than a half ounce. This is a point of some importance, and needs close examination. I procured the eggs of the "pea-nut" from T. S. Pleasants, and I am pleased with their cocoons, but further experiments are necessary to decide whether or not they are adapted to the climate of Virginia. Respectfully yours,

LAYTON Y. ATKINS.

PROGRESS OF SILK CULTURE IN THE NEIGHBORHOOD OF PHILADELPHIA.

From Morris's Silk Farmer.

The remark is frequently made, by persons not engaged in this interesting business, that every body is raising trees, but few or none are raising silk. Such remarks can only proceed from ignorance of what is really the condition of the silk business among us; and while great pains have been taken to inflame the public mind respecting the multicaulis, none whatever, or comparatively very little, have been taken to diffuse information as to the progress of the culture of silk. Hence the remark above named being so general. But there are facts in existence strong enough to satisfy the public mind, if candidly stated, that the raising of silk is going on as rapidly as the nature of the business will admit, and as the most sanguine could possibly desire. These facts are well known to those interested in the business, and may be briefly stated. Ten cocooneries have been built (within the writer's own knowledge) within a year past, in the neighborhood of this city, some of them large enough to feed two millions of worms; and others are in contemplation. One establishment near Philadelpha raised near 700 ounces of eggs last season, which sold last fall at ten dollars per ounce; and the balance which remained on hand this spring sold readily at from twenty to twenty-five dollars per ounce, and the demand was active enough to have absorbed three times the quantity. The whole cost of producing this 700 ounces did not exceed $1200, while they sold for not less than $12,000. All these eggs were purchased for actual feeding, and have been distributed throughout the country, there to be propagated, and to add fresh stimulus to the business. Besides these, many hundred ounces have been imported from France, and have met with ready sale at $20 per ounce, even when purchased in quantities amounting to $1000 at a time. This article is in so great demand, that holders consider it no object to abate the price to secure a large sale. Still there is a scarcity of eggs, and the demand of this spring cannot be supplied. It is doubted whether the supply produced in 1839, from domestic increase and foreign importations united, will be sufficient to meet the demand for 1840. It is believed that not less than twenty millions of worms will be fed on the multicaulis this summer, within thirty miles round Philadelphia. At Burlington, a large company has gone into operation, with the sole view of raising silk. They do not own a single tree, and have therefore no stake in what is called the tree speculation. Their intention is to use the large amount of leaves that will be produced the present summer at Burlington, and to convince the incredulous that silk can be raised to great profit, on a scale of the greatest magnitude.

In addition to these facts, of which many similar might be readily adduced, there is a demand for silk reels, and silk machinery generally, which is astonishing even to those best acquainted with the business. These reels are furnished by the makers at a cheap rate, within the means of every small farmer, and are sold as fast as they can be manufactured. A manufactory of the celebrated Piedmontese reel has been established at Germantown, where the article is supplied at a low price. A knowledge of the art of reeling is thus being rapidly and extensively diffused over the country—as rapidly as any man ought to expect a new business to extend itself—and quite as much so as any other new enterprise within the reader's recollection. Such is the beginning of the silk business in Pennsylvania and New Jersey. That there is a solid foundation for it, the legislatures of nine states have emphatically asserted, by giving noble bounties to stimulate and sustain it.

PROGRESS OF SILK-CULTURE IN VIRGINIA.

To the foregoing article we are rejoiced to be able to add, that in Virginia the culture of silk has already been commenced by so many individuals, as to warrant the confident expectation that, by next season, it will be a regular and established business with hundreds who are now but novices and experimenters; and that their successful example will be soon followed by thousands of other beginners.

In the neighborhoods of Fredericksburg, Richmond, Petersburg, and in Brunswick county, this spirit is most extended and active. In and near Fredericksburg, are the oldest as well as among the most complete cocooneries—those of Messrs. W. K. Smith, and L. Y. Atkins. Near Richmond, Mr. Curtis Carter is one of those who are now feeding silk-worms to as great extent as temporary accommodations permit; and he is now erecting a new building for a cocoonery, 110 feet long by 30 in width, and two stories high. Mr. John Carter is also feeding to considerable extent; and Mr. Staples on quite a large scale. Sundry others, in and near Richmond, have experimented to less extent, and with results satisfactory to themselves under the existing circumstances.

In Brunswick, Mr. Thomas Hicks has enlarged and improved his facilities, first used last year, and will feed more largely. A joint-stock company is there also extensively engaged in feeding; and, as we have heard, perhaps a hundred separate individuals on a small scale of experiment.

In and near Petersburg, no one has yet prepared complete fixtures and accommodations, but several persons have commenced, or have determined to prepare for the regular business; and many have fed silk-worms this spring, under every variety of disadvantage, and yet generally with successful results, and fair products.

Lastly, though among the first in operation, in zeal, and, we doubt not, in future valuable results, are the occupiers of Bellona in Chesterfield; where no care is spared to acquire and to apply the best information on silk-culture; and whence, we trust, it will be diffused, for the instruction and profit of the whole commonwealth.

It would be unreasonable for any one of these new experimenters to expect *net profit* upon his first adventure. Of course, every such first trial *must* be made at loss. But it is a gratifying fact that very few persons have been discouraged by this price necessarily paid in advance for experience, and that nearly all whom we have heard from will continue the business, with greatly increased confidence and energy. The pioneers have, in effect, taxed themselves to pay a bounty for introducing and establishing silk-culture in Virginia; and thus, while the most zealous and public-spirited will bear all the burden of the tax, and first cost, they will but share with all their fellow citizens in the eventual benefits.

We trust that nothing now can obstruct the progress of this important new culture, and prevent its becoming a great business in the United States, and especially in Virginia and the other southern states. The establishment and diffusion of silk-culture will be the greatest agricultural and economical benefit ever gained by this great region, except the introduction and use of calcareous manures; and these two great improvements will most happily unite with, aid, and give increased value to each other.

THE MULBERRY CROP, AND PRICES.

The planting of morus multicaulis trees this year in Virginia, and generally in the United States, has become so large and costly a business, that it forms an important item of agricultural labor, investment, and product; and on that score alone, deserves notice, whatever may be the opinion as to the propriety, and ultimate profit, of this direction of so much energy and so much capital.

Though there has been no lack of opinions, predictions, promises, and rumors, of prices of morus multicaulis plants of the growing crop, all seemed uncertain, and little worthy of trust, until very recently. Therefore, we have remained silent on this point, until we had facts, and such as were unquestionable, to report, instead of mere opinions, or rumors of prices and prospects.

There now can be no doubt of a general short crop of the morus multicaulis. Besides the many concurrent newspaper statements, which have been open to the public, we have had private letters and other information giving reports from Pennsylvania to Florida inclusive. All such reports are of very short crops—the numbers of plants standing in each particular lot stated as varying from one-half to one-tenth of the cuttings planted; and fewer persons exceeding the former proportion, than there are who fall short of the latter. Of our own planting, there is standing but three-eighths of the mature and well preserved cuttings planted. We have heard of but one place where the stand is reported to be all satisfactory; this is the vicinity of Burlington, New Jersey; and of this, our information is by no means full or precise.

The causes of the general and great failure of the cuttings to grow, (where sound and fresh, and properly preserved,) were, the following:

1st. In many cases, improper management in planting—in which some of the most experienced cultivators have suffered greatly; and almost every planter now knows some one or more great errors which he committed, and the avoiding of which would have prevented half his present loss.

2nd. The long and severe spring drought.

3rd. And still more, the planting of single-bud cuttings, which was done almost universally in the south, even when of the smallest size. As to cuttings of unripe extremities, which the raisers have planted extensively, there has been so total a failure, as to show that they are not to be relied on at any time.

We know nothing of the crop north of Pennsylvania, and it is almost too soon for it to be yet above ground. But there, every year will show a failure, or at least what would be considered a great failure here.

Mr. Prince, notwithstanding his undoubted great advantages at his own nursery and garden on Long Island, *has made a large planting in Virginia.* This is a most striking evidence of the vast superiority of our climate for this culture; and a not less complete admission of Mr. Prince's not confiding in his own former assertions and claims, in this publication, in favor of the northern growth. His argument, then maintained, if it needed any refutation, is now completely refuted by himself.

The whole crop of the United States, we infer, cannot much exceed half of the proportion expected to grow from the cuttings planted. Of course, whatever might have been the demand, for a full crop, must be greatly increased.

Not many sales of trees of the growing crop have yet been made in Virginia. In the early part of the year, a contract, as large as the buyer chose to make, was made to deliver trees, in Greensville county, next autumn, at 6¼ cents. Some other, and large contracts were made at 12½—and of these, one in Nottoway between two intelligent and wealthy landholders, was as late as two or three weeks ago. Still later, an entire lot of 20,000 trees were sold in this town for 15 cents each, not to include any under three feet high. In Richmond the following sales of growing trees have been made within the last week. Thomas J. White, esq. sold all the trees, of his crop (10,000 cuttings planted,) which may reach or exceed 3 feet in height, at 25 cents. Messrs. Hill and Dabney sold 3000 trees, all to be as high as 4 feet at 27 cents. Messrs. L. and R. Hill bought a lot, to include all of 4 feet and more, at 27½ cents. No holders there will now take offers of less than 25 cents the tree.

On the 24th of June, a small lot of the roots and young shoots of 50 trees (being all on the piece of ground, now in the fourth year from the planting of the buds,) raised by S. D. Morton, esq, of Petersburg, were sold by him for $5 each. The tops had been cut off at the ground last fall, and sold then at $10 each. As this is the only instance yet known of two successive years' sales from precisely the same stock and land, we had the curiosity to have the ground accurately measured. The trees occupy (*partly*, for the ground has also two rows of corn to each row of trees,) a space of 20 by 60 feet, including 3 feet of additional space beyond each outside row.

This is at the rate of 1815 trees to the acre; and at $15 each, the amount of cash sales for the two successive years' growth, from the same roots, is at the rate of $27,225 per acre. This is pretty well for a "humbug," (as some still call it,) of two years' duration.

We might state *reports*, and apparently on good authority, of sundry higher prices, offered and refused, or taken; but we have disregarded all rumors of prices, and all offers not accepted—as most of such reports are founded upon error, and *not a few upon fraudulent intention.* Judging however from the real transactions stated, it would seem that the price has been certainly and steadily advancing to this time, and that good profits at any rate may be secured by every planter, whose loss of plants does not exceed 80 in the 100. As to whether the prices have reached, or nearly reached, their greatest height—or whether they will (as most persons suppose,) rise much higher before the crop is ready to be delivered—we shall not presume to offer an opinion.

Since writing the above, a private letter from an extensive planter and dealer, in Burlington, New Jersey, has been shown to us by the friend to whom it was addressed, and at our request, permission was given to copy the following extract, which more than confirms what we had stated. The writer is a man who stands on the highest ground for sound discretion and judgment, and unimpeachable integrity. His facts are important. To his mere opinion, the reader may attach what degree of importance it may seem to deserve.

"*Burlington, N. J.*, 6 *mo.* 24*th*, 1839.

"There are very great failures in this region of country, but at this place they are doing better than in most others. My trees, [from which the planting was made,] were not very large, it is true, but they were in very good condition; and yet they will not give me a return of more than 6 for 1. Some others have as much as 8 for 1, and one of my friends here has more than 12 for 1. But, from what I can learn, I think 5 for 1, will be a large calculation for New Jersey and Pennsylvania. I have a letter from Hartford, from a gentleman from this state, in which he says the trees in Connecticut, have come up badly. I have purchased about 60,000 to be delivered in the fall; the first 50,000, at 15 cents for three-feet trees, mature wood, exclusive of the roots, all raised from cuttings. These were purchased about two weeks ago; they would now bring 25 cents. The last purchase was 10,000 in this place, which I expect will be very fine, at 25 cents per tree, without reference to sizes. Several sales have been made here at 25 cents, and one of 6000, at 30 cents. The last is I think, the highest price yet obtained. But I believe they will be 50 cents, before next month expires."

STATE OF CROPS.

The condition of the wheat crop in Virginia is not only very different in different sections of the state, but in the same and small districts, and even on neighboring farms. Hence the impossibility of guessing at the general result, from particular reports. The product of numerous crops in the tide water region will be reduced, by the ravages of the Hessian fly, and still more of the chinch-bug, to less than the fourth of a fair crop; yet other farms in the same counties will make an average product. The relative product of the great divisions of the state (in general, though with many exceptions,) is still believed to be as stated in our last number; that is, increasing from very short crops in the tide water and adjacent higher counties, to better in the middle region, still better in the Piedmont range of counties, and to very fine crops in the great valley, or region west of the Blue Ridge.

The corn crops are good, and afford a fine prospect, except for the great danger of the chinch-bugs passing from the wheat to the corn fields. We wish that some of our readers would furnish for publication such facts as they have learned by observation, of the history and habits of this destructive insect. Such a subject at the north would have engaged the pens of scores of observing and suffering farmers; here, of not one.

Oats are very good, owing to the unusual amount of moist and cool weather in the latter part of spring.

The crop of tobacco is remarkably good.

LIMING.

To the Editor of the Farmers' Register.

It is one of the great blessings of man, that the discoveries and experience of past ages may be handed down from generation to generation, until time shall make his practice in the arts, sciences and professions, perfect. This is what he proudly calls mind, his electrical part; and yet sir, in truth what is he? A poor thing, a "wild ass's colt." We, sir, the good people of Virginia, received from the hands of our Heavenly Father the fairest, the kindest portion of dear old mother earth, and what is it now? Thorns and briers? No sir, it is gullies, sedge and poverty grass; the experience of ages has been scoffed; and like that proscribed animal of the Jews, we have rooted up and destroyed the pasture upon which we fed. Is this turning the experience and mind of past ages to our use and benefit? Have we done better in other matters necessary to the civilized man, than that which we have done in agriculture? I fear not, "wise in our own conceit," folly has had a mark to point at. I was going to show, sir, that we had done in many other matters as in agriculture, but I should trespass upon your rules and space, and shall, therefore, turn my pen to some report of our crop of wheat. This is good; for how could it be otherwise upon land well prepared and limed? Wheat, corn, oats and grass, all upon limed land, show that hitherto we have been in the dark, we have literally "toiled all night and caught no fish." None of those, or any other crops, can be made to fail upon limed land, if it be well drained; and I could not give you a true description of those crops without incurring suspicion of inaccuracy. To make two or three times as much as I have ordinarily made, is almost matter of alarm; but I hope to get through with it, and could I persuade my friends and neighbors to lime their land, I should think that I had lived for some purpose. One thing is inexplicably strange. I have fine clover; and yet I am told that this has failed both in the lime-stone and mountain country. No address that I can use with my neighbors, can persuade them; they are far worse than Thomas O'Dedimus; for feeling or seeing will not avail me. But, sir, our march is onward; self-love, that powerful and controlling feeling, will make sure our success; for though pride may retard, interest will ultimately prevail. At a future time I will give you some account of the crops of my predecessor, compared with those now made; not for the purpose of boasting, for I feel that I have done but little; but to show you that, in spite of conceit and ignorance, our march is onward. That you will live to receive the homage of a grateful community, I doubt not, for you well deserve it. LIME.

P. S. I look soon for the day, when farmers will leave the dirty mire of party politics, and contend for the cheapest, and most sure protection of person and property. This is their duty and interest; and they cannot be so unwise as not to see it. One-half of the effort made in party politics would make millions of dollars' benefit to agriculture. Who can doubt therefore the ultimate results?

L.

Fairfax county, June 3rd, 1839.

ON THE SYSTEM OF HUSBANDRY PRACTISED IN LOUDOUN COUNTY, VIRGINIA.

From the American Farmer.

Loudon County, August 12th, 1818.

Dear Sir,—I have the pleasure to acknowledge the receipt of your's of July, and I venture, although but an indifferent penman, to answer your queries on Loudoun husbandry. I hope you will excuse my manner of writing, and attend only to the matter which I shall communicate, which is founded on a long experience in agricultural pursuits; and as information is all you want, I shall endeavor to answer your queries, by taking them collectively, and in so doing, I shall confine myself to stubborn facts which cannot be disproved.

The first thing that I shall notice, is the plough. The improvement of this valuable machine, was the first step we took to improve our lands, we formerly adopted the absurd plan of shallow ploughing, leaving the under stratum unbroken, which should have been torn up and mixed with the surface; we have constructed our ploughs much larger and stronger than they formerly were; the mould-boards are all of cast iron. We seldom break up our land with less than three horses to a plough, which enables us to plough our ground deep. In the fall or early in the spring we break up our corn ground, then harrow it well with a heavy iron-toothed harrow; this done, checker it with a shovel plough, leaving our rows from 3½ to 4 feet apart, ready for planting. When we commence planting corn, we take out water and plaster of paris, and after wetting the corn, then put on as much plaster as will stick to it, and make the grains separate freely, and keep it in that state by adding water and plaster when necessary, until we are done planting. When our corn gets to the usual size for harrowing, say four or five inches high, we hitch two horses to a harrow, and run once over each row, minding to straighten all the corn that gets bent or covered up by this operation. When our corn is fit for thinning, we generally leave but two stalks in a hill; after we have done this, let our land be never so good, we take as much plaster as we can with a thumb and two fingers, and drop on each hill of corn; should drought succeed after we have done plastering, we do well to work our corn so as to cover the plaster, as long droughts and hot sun are injurious to its stimulating powers. This method of cultivating corn, is generally pursued here, and seven or eight barrels to the acre, is considered a saving crop, but ten or more to the acre is very common here.

I have been in the habit of using plaster more than twenty years, and its effects on every kind of vegetation (sedge-grass excepted, which it diminishes,) are surprisingly great. There is no arable and left unsown with clover seed here,—neither is plaster of so much benefit to land left bare of grass; plaster is not a manure, but a stimulus; it stimulates clover, and clover manures the land; three pecks of plaster are enough as a top dressing for clover per acre, and all kinds of small grain including hemp and flax, are benefited by the same quantity to the acre. Early in the spring we sow plaster on our clover pastures and grain fields. Our sheep are not permitted to run in the clover fields in the winter, and are kept out in the spring, until the clover is well grown—at this time also hogs are permitted to graze upon it, and if they are well salted, they will thrive as long as the clover lasts. The second crop injures stock, particularly horses, very much, by creating a slavering, and it is best to keep them off, and devote the second crop to seed, as it makes the best seed. We generally salt our clover hay, and put it under cover, not much together: mixing it with straw, answers a good purpose. In saving clover seed, the heads should be gathered quite dry, and kept in that state until sown. Those who save seed for market too often heat it, which prevents it from coming up; the good or bad quality of clover seed, may be discovered by filling a glass tumbler half full of water, and dropping a few seed in, those that sink are good, those that swim are generally deprived of their vegetating powers. Clean seed should be sown in the following manner. Let the weather be calm (which is also necessary for sowing plaster) and let the ground be laid off into eight feet lands; take as much seed as you can between your thumb and two fingers for every two casts or steps, and let the casts not exceed the width of the land. But we generally raise our own seed, and sow it in the chaff.

Wheat is grown here mostly upon fallowed land, which is prepared as follows: in the months of August and Setember, we turn our clover under nine or ten inches deep, in ten or fifteen days after we harrow the ground well, then sow and plough in the seed with a shovel plough in eight feet lands, this method saves the trouble of staking off the ground in the spring of the year, for sowing clover seed and plaster, which should be done in March or April. But sowing fallow with one ploughing is the general practice here, we sow one and a half bushels of wheat on the acre. The average product of the wheat crops may be stated to be from 18 to 30 bushels to the acre; I have myself raised crops of wheat averaging 30 bushels to the acre off of fields, which, before I used plaster and clover, would not bring me more than 18 bushels.

Manure is a grand object here, every thing taken from the earth, when returned is beneficial to it. Mr. Madison has a more favorable opinion of corn-stalks than I have. Corn-stalks and buckwheat straw, answer very well to fill gullies. When we got out our wheat we haul out the straw into the fields, and stack in pens on the poorest places of the field, and let our cattle have their will of it—all other coarse kinds of manure ought to be taken to the field before it loses any of its strength and ploughed in. Where there are but few or no slaves our farms are small, 150 or 200 acres is considered a good farm, one-third ought to left uncleared—ten or twelve acres are sufficient for meadow, as we mow as much clover off our high land as we want.

All timothy meadows are the better of water, especially in the winter—throw the water over a bank and let it freeze no matter how deep. All wet land ought to be drained by ditching—if there is not very much water, cut your ditch two feet deep, and as wide, fill it half full with round stones, then take corn-stalks, leaves, buck-wheat straw, or any other trash and cover the stones, then fill the ditch with dirt, and it wants no more repairs.

There are different soils here, as many as two or three different kinds in one field; red land is the worst, and requires the most manure, the gray flint is the most durable. Our former mode of fencing was with split rails; but as wood grows scarce, we substitute stone, and that is one reason why our lands sells so high. From Potomac to Fauquier I suppose is 25 miles—from Goose creek to the Frederick line 20 miles. On this tract of land I suppose there is stone enough to inclose it all in 20 acre fields. Our mode of putting up stone fence, is as follows. 1st, Clear away the loose earth four feet wide, to prevent the frost from getting under it—then haul the largest stone, and put them in the bottom—taper it on each side till it is twelve inches wide on the top, this is done by stretching a line on each side, fixed to a frame like a rafter level four feet high, the shape of the fence. When the fence is raised four feet high with stone, we take stones that will reach across the top, and place them along the distance of the rails, lay one rail on each stone, then two stakes to each rail, and a rider on the top; this strengthens the fence and prevents sheep from climbing over.

I remain your obedient servant,
ROBERT RUSSELL.

Geo. W. Jefferies, Esq.

OSAGE ORANGE SEEDS.

The seeds of the Osage orange are in demand; and if any of our subscribers in the west can contrive to send a few bushels of seed to some of the Atlantic cities for sale, we have no doubt but it would be a profitable little adventure. The tree is very hardy, and is valuable for ornament, and for making live hedges, and it also furnishes good food for silk-worms; though the latter quality will be of little use in this country, as the mulberry is so little liable to suffer from spring frosts. See Far. Reg. pp. 35, 543 and 702, vol. iii.

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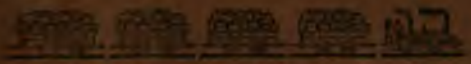
TO PLANTERS,

On and near the Appomattox,



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Produce sent down the Appomattox, will, if so directed, be forwarded by this Rail Road to Richmond. The Depot Agent at Pocahontas, (Mr. Squires,) will attend to the forwarding from the Basin in Petersburg, and pay the drayage. The Company will not be liable for accidents or losses, except as at present, on its own road. A forwarding commission of 10 per cent. on the freight of this road will be charged by the Agent, and received with the freight and drayage.

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☞ Freight on tobacco $1 per hogshead, on wheat 6 cents a bushel.

Richmond, June 20, 1839.—n&a.tf

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Goods sent by this Railroad will, if so directed be forwarded to any point on the line of the Petersburg and Roanoke, or Raleigh and Gaston Railroads, and goods sent by those roads to Richmond, will be received from the depot in Petersburg and brought on. The depot agent at Pocahontas will attend to the forwarding, but this company will not be liable for accidents or losses, except as at present on its own road. The freight and passage through, on goods sent from Richmond must be paid there in advance, and on goods sent to Richmond may be paid either here or in Petersburg. A forwarding commission of 10 per cent. on the freight of this road must be paid to the agent, which will be received with the freight and drayage.

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Richmond, Feb 1.—n. tf

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The following publications are for sale at the Office of the Farmers' Register, and will be sent by mail, or otherwise as required, at the following prices, upon *cash and post-paid orders.*

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April 30, 1839.

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OF BALTIMORE.

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50,000 Morus Multicaulis, or Chinese Mulberry Trees.
10,000 Alpine Mulberry Trees, selected with care.
5,000 Canton do. do.
5,000 Rose of Lombardy do.
10,000 Other varieties. Apply to

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Commerce street, Baltimore.

March 31.—stf

NO-BONE

BREED OF HOGS.

For sale, full blood pigs of this breed which is so valuable for readiness to fatten, on clover grazing, or in the stye. Price $5 each. Inquire, (post-paid,) of the editor of the Farmers' Register.

May 31.—tf

100,000 MORUS MULTICAULIS TREES, are wanted by the subscriber, deliverable in November next. Persons disposed to sell will please communicate their terms.

JAS. WINSTON.

Richmond, June 21, 1839.

SILK-WORMS' EGGS.

The subscriber offers for sale silk-worms' eggs of this spring's laying, of the following kinds.

Of one-crop white and gray worms, do.—

Of two-crop worm, which kind may be relied on to hatch again the same season.

Every care has been and will be taken to have each kind genuine, and kept separate and free from mixture with others. The eggs will be sent by mail, (or otherwise,) for orders, containing the purchase money. The prices will be as low as those of any good and genuine eggs in market; and the purchaser may rely upon receiving the article promised, and in the full quantity charged for.

Orders, *post-paid*, may be sent either to the care of the editor of the Farmers' Register, Petersburg, or to the subscriber, directed to Garysville P. O. Prince George, Va.

EDMUND RUFFIN, Jr.

Coggins' Point, May 31, 1839.

VIRGINIA SILK AGENCY.

The subscriber respectfully informs those engaged in rearing silk, that he has opened an office over the store of Messrs. James M. Radcliffe, & Co., Main street, for the purpose of attending to the silk business in all its various branches, viz.: will purchase, or dispose of for account of the growers, cocoons and silk in all stages, as soon as rates can possibly be fixed; and now offers for sale, Mammoth white, grey, and yellow, two crop white, and six weeks yellow ball silk worm eggs.

ALSO,

Morus multicaulis, in any quantity, now growing in various sections of the state, deliverable on 1st November next, in lots to suit purchasers. The best security will be given for every sale, and the same required.

All communications must be post paid.

J. H. D. LOWNES,
Richmond, Va.,
Agent for the planters.

References.—Dunlop, Moncure, & Co., Lancaster, Denby, & Co., Richmond, Va.

April 30—n&atf

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ELEMENTS OF CIVIL ENGINEERING,

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June 1.—n2t

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Trains depart every morning at a quarter before 8, and every afternoon at 3 o'clock, (except Monday,) for City Point.

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This road, connecting the main line extending from north to south, three times a week, with the James River and Baltimore steam-boats, affords passengers from the south, going north, the opportunity of sleeping in Petersburg, breakfasting at the usual hour, and full time to take the Bay line, on Wednesday, Friday, and Sunday.

Passengers in the James River and Baltimore boats for Richmond, by taking the City Point rail-road, will reach Petersburg in *thirty minutes*, where business may be transacted, and get to Richmond the same evening.

Passengers going down James River from Richmond, by taking the evening train at Petersburg, may breakfast there the next morning at the usual hour, and reach City Point by the rail-road in full time for the James River boats for Norfolk and Baltimore.

WM. MORRIS,
President.

Oct. 1—tf.

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The subscriber wishes to obtain a situation for the ensuing year, as steward, or overseer of a large farm, or landed property. He would prefer a location in some healthy part of the south-western states, if a sufficient inducement were offered for his removal. For his knowledge of agriculture, of accounts, and of such other business as belongs to any such situation as he offers to fill, the subscriber refers to Edmund Ruffin, Petersburg, Va., Editor of the Farmers' Register, or to Edmund Ruffin, Jr. in whose employment he now is and has been, on their Coggin's Point farm, for the last four years.

ANDREW NICOL.

Coggins' Point, June 15, 1839.

TO SUBSCRIBERS.

On the cover of this number, which completes half the volume, each indebted subscriber will see stated what he owes. The punctual payers—and we count every subscriber punctual who pays for each volume before it is completed—need not consider this memorandum as urging them to greater haste. Those who are indebted for more than the current volume, we hope will consider this notice to be as urgent as it is proper. If any error should appear to exist by any of these statements, we request that the means of correction may be promptly afforded, and the proper correction shall be forthwith made.

H. Nutt.

Rodney R Rodney Rodney
Rodney Miss

Rodney

THE

FARMERS' REGISTER,

Rodney

A MONTHLY PUBLICATION,

Devoted to the Improvement of the Practice

AND

SUPPORT OF THE INTERESTS OF AGRICULTURE.

EDMUND RUFFIN, EDITOR AND PROPRIETOR.

Vol. VII. JULY 31, 1839. No. 7.

> And he gave it for his opinion, "that whoever could make two ears of corn, or two blades of grass, to grow upon a spot of ground where only one grew before, would deserve better of mankind, and do more essential service to his country, than the whole race of politicians put together." *Swift.*

PETERSBURG, VA.

PUBLISHED BY THE PROPRIETOR.
1839.

[This publication consists of four sheets—postage for 100 miles or less, 6 cents—over 100 miles 10 cents.]

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Flour, (superfine)	5 50	do. (lugs)	$4½ to $7½
Corn, per bushel 90 cents,		Bacon, (hog round)	12 cts.
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I have two hundred plants of the Maclura or Osage Orange, from three to five feet high, which I will sell, deliverable next winter, at one dollar per pair, (male and female.) In a few years they will bear fruit abundantly. Orders may be left with the editor of the Farmers' Register, or forwarded direct to

THOMAS S. PLEASANTS,
P. M. Beaverdam, Va.

THE FARMERS' REGISTER.

VOL. VII. JULY 31, 1839. No. 7.

EDMUND RUFFIN, EDITOR AND PROPRIETOR.

REMARKS ON THE VEGETABLE KINGDOM.

[Continued from page 376.]

Plants, from what has been said, are organized bodies, and, like animals, capable of begetting their like, and continuing their species; each kingdom having male and female organs of reproduction. The first and most important account we have of the vegetable kingdom is recorded by Moses, in the 1st chapter of Genesis, 11 and 12 verses. "And God said let the earth bring forth grass, the herb yielding seed, and the fruit tree yielding fruit, after his kind, whose seed is in itself, upon the earth: and it was so. And the earth brought forth grass, and the herb yielding seed after his kind, and the tree yielding fruit, whose seed was in itself after his kind: and God saw that it was good." I infer from the passages just read, that the seeds of plants were organized in miniature, and when evolved required the vivifying influence, or male dust, to render them fruitful. The inspired writer does not say the principles or component parts, that form seeds, were given; he states positively and explicitly "whose seed is in itself." I take the passage then as it is written, in its plain literal sense, and will not trouble myself about vain theories of the schools, respecting the fructification of plants and the generation of animals. If man may be permitted to raise the veil and explore the hidden laws of nature within, I too, have written and published to the world, a speculative theory on "Generation," entitled perhaps to some credit for its plausibility; yet, I must publicly acknowledge that it stands on medical record, an effusion of vanity and presumption. The seeds of both kingdoms were given by the all-wise creator, and it never was intended that man, a worm born and nourished in sin, should understand such divine mysteries.

The most simple form of organic matter, was first brought into being; for it seems from the Mosaic narrative, that the earth's surface was clothed with vegetation before any mention is made of the animal kingdom; and the most remarkable circumstance in the two verses read, is that God gave to each class, order, genera, and species, its like in miniature, viz., he gave to each plant, herb, &c., seeds, for the purpose of their reproduction and continuance. It would appear from this account, that primitive vegetation, or that kind of vegetation spoken of by Moses, was not of sexual origin, but the immediate work of God. Unless it be admitted that our planet, six thousand years ago, was the ruins of a former world, having seeds promiscuously deposited in its chaotic mass; and when renovated and reduced to order the necessary agents acted on its surface and produced germination. Some philosophers of the present-day are inclined to this opinion, and think it consistent with the cosmogony of Moses: they say there are many circumstances which favor such an opinion. The infant sciences of fossil botany, and fossil osteology, are bringing daily to our view the remains of fossil vegetable and animal relics, imbedded in carboniferous and chalk formations, that come under no known order, genera or species, and are unknown to the botanists and anatomists of the present day. Hence it is concluded, that they had an existence long before the Mosaic history, and are fossil remains of a former world; or the remains of this world, before it was last renovated and fitted up for the reception of the present organic race. The science of geology has already proved that the surface of our planet has not existed in its present form from eternity; but has been revolutionized, in passing through many series of creative operations, succeeding each other at long intervals of time. Primitive and secondary formations contain fossil organic remains, both of the vegetable and animal kingdoms, differing in structure from organic remains of the present day. The microscope brings to view vegetable and animal organic remains, from the greatest depths ever reached by the art of man, or currents of water. From this circumstance we must infer, that the earths surface has not only been broken up and dissolved, but its whole mass agitated and convulsed by terrible events. The Rev'd. William Buckland, D. D. in his Bridgewater Treatise on geology and mineralogy, vol. 1st, page 390, says, "the number of fossil plants as yet described is about 500; nearly 300 of these are from strata of the transition series, and almost entirely from the coal formation. About 100 are from strata of the secondary series, and more than 100 from the tertiary series. Many additional species have been collected from each of these series, but are not yet named. As the known species of vegetables are more than fifty thousand, and the study of fossil botany is as yet but in its infancy, it is probable that a large amount of fossil species lies hid in the bowels of the earth, which the discoveries of each passing year will be continually bringing to light." In giving an account of the coal mines in Bohemia he says, "the most elaborate imitations of living foliage upon the painted ceilings of Italian palaces, bear no comparison with the beautious profusion of extinct vegetable forms with which the galleries of these instructive coal mines are over-hung. The roof is covered as with a canopy of gorgeous tapestry, enriched with festoons of most graceful foliage, flung in wild irregular profusion over every part of its surface. The effect is heightened by the contrast of the coal black color of these vegetables with the light ground work of the rock to which they are attached. The spectator feels himself transported as by enchantment into the forests of another world; he beholds trees of forms and characters now unknown upon the surface of the earth, presented to his senses almost in the beauty and vigor of their primeval life; their scaly stems and bending branches, with their delicate apparatus of foliage are all spread forth before him; little impaired by the lapse of countless ages, and bearing faithful records of extinct systems of vegetation, which began and terminated in times of which these relics are the infallible historians."

"Such are the grand natural herbaria, wherein these most ancient remains of the vegetable kingdom are preserved in a state of integrity, little short of their living perfection under circumstances of our planet which exist no more. Lindley and Hutton, state, '*Fossil Flora*,' page 16, "that it is the beds of shale or argillaceous schistus which afford the most abundant supply of these ancient relics of a former world; the fine particles of which they are composed having sealed up and retained in wonderful preservation and beauty the most delicate forms of the vegetable organic structure." From these quotations, and many others that might be brought forward, our planet probably had an existence before the Mosaic account of the creation. And hence it is that geological research has, until within a few years past, been considered hostile to revealed religion. But I am inclined to the belief, that when the science of geology is properly understood, it will be calculated to give us the most exalted conceptions of the wisdom, power, and goodness of God. Geology has already thrown much light on many parts of Mosaic history, and in a few years it will be considered one of the most popular branches of science taught in the schools. "If I understand geology aright" (says Professor Hitchcock), "so far from teaching the eternity of the world, it prove more directly than any other science can, that its revolutions and races of inhabitants had a commencement, and that it contains within itself, the chemical energies, which need only be set at liberty by the will of their creator, to accomplish its destruction. Because this science teaches that the revolutions of nature have occupied immense periods of time, it does not, therefore, teach that they form an eternal series It only enlarges our conceptions of the deity; and when men shall cease to regard geology with jealousy and narrow minded prejudices, they will find that it opens fields of research and contemplation as wide and as grand as astronomy itself."

As soon as chaos was reduced to order, and the waters separated from the earth, Gen. 1st. 9, 10, God clothed and beautified the land with vegetation. Whether the whole or a part of the dry surface was clothed in vegetation at that time, seems hard to tell; the inspired writer merely states the fact, and says, "let the earth bring forth grass, the herb yielding seed, &c.:" the probability is, that only a small part of the ancient continent was at that time raised from the water to be decked with grass, herbs, &c., for the wants and support of the animal kingdom which was to follow. According to botanists, the entire number of known species of plants, now existing on the surface of the globe are 55,000; and they have divided the 55,000 species in 24 classes, according to their numbers, connections and stations of the male and female organs. The 24 classes, owe their distinctions to the stamens or male organs; and the sub-divisions of the 24 classes, are marked by the number of pistils or female organs.

If all vegetable seeds that have been formed on the earth in the last six thousand years, could have multiplied their species, unmolested and undiminished, and each plant retain its organization entire, together with the various crops of vegetation that have adorned this earth, the mass would in all probability so far exceed that of the tobacco and spleen-wort, as to fill the orbit of this earth.

I will now conclude with a few remarks on the fossil remains of vegetables.

The former races of vegetation that have beautified this earth for many thousand years, have passed away; except that portion the all-wise creator locked up in the bowels of the earth for the future use of man. We have reason to believe, immense forests have been heaped together in large masses, by violent convulsions of our planet, and transported to the bottom of ancient seas; and after being submerged and carbonized for ages, they were belched up by subterraneous fires, and elevated to the tops of lofty mountains, in the form of mineral coal. That coal is of vegetable origin, I infer: 1st, from the presence of terrestrial and marine plants in coalmines. 2ndly, when pit coal is seen through a microscope it is found to contain organic remains of wood, bark, leaves, and even the seeds of plants. 3rdly, the skeleton of plants are frequently found after burning coal in a furnace. "It is evidently seen, by the nature of the mountains which contain coal, that their formation has been submarine; for they all consist either of schistus, or grit, or lime-stone." These beds of fossil vegetable remains are now becoming the richest treasures of man, infinitely more valuable to him than silver and gold. They employ the labor and attention of a large portion of the human family at this time, and are daily becoming more and more interesting. The combustion of coal is substituted for manual labor throughout the whole civilized world; the surface of the earth is to be broken up and cultivated by the combustion of this vegetable mineral, and it will be the support of future generations. The great use of coal in administering to our wants, ought to interest every individual; we are deriving light and heat from fossil vegetation, that perhaps clothed this earth before its present surface had an existence. These primeval vegetables have not, like modern vegetation, undergone decay in yielding their elemental principles back to the atmosphere which nourished and gave them being; but are treasured up in subterranean beds and have become carbonized masses of coal, which, in the present age of the world, are to man sources of industry and wealth. The city of London consumes five tons of coal per minute, 300 tons per hour, 7.200 tons per day, 216,000 tons per month, or 2,628,000 tons per year: which, at 12½ cents per hundred pounds, will amount to the enormous sum of $6,570,000 per annum; and its consumption in Great Britain and on the continent is beyond calculation. All the mechanical powers, the lever, the wedge, the screw, the wheel and axle, and the inclined plane, are in active motion, and made subservient to the arts, by the expansive force of this useful mineral. The combustion of coal is found at the bottom of the mines, in the work shops of the trades and family dwellings; on the ocean and all navigable waters; on rail-roads and public highways; it lights up our cities, towns, and villages, increases population, begets riches, wealth and power, and dispenses light, warmth and comfort equally to the king and the peasant. It is the grand auxiliary in the arts, agriculture, commerce, manufactures, navigation and trade; and is daily and hourly administering innumerable blessings to the human race. What I might ask, would be the situation of England, without the fossil remains of vegetables? Her astonishing manufacturing machinery, with a capital of 700,000,000 dollars, could not be kept in motion without it; could her 20,000 steam engines, that are continually cutting, splitting, sawing, hammering, filing, polishing, twisting, screwing, pumping, rowing, propelling, depressing, excavating, winding, weaving, carding, spinning, and a thousand other operations be carried on from her forests, unassisted by mineral coal? I should suppose not; for it would require half the population of this globe, to move the various complex machinery of England, with the same force and effect that is produced by the combustion of coals. "The amount of work done by machinery in England, has been supposed to be equivalent to that of between three and four hundred millions of men by direct labor, and we are astounded at the influence of coal and iron and steam upon the fate and fortunes of the human race."

Sir J. F. W. Herschel, in his Treatise on Natural Philosophy, page 59, says, "it is well known to modern engineers, that there is virtue in a bushel of coals properly consumed to raise 70 millions pounds weight. This is actually the average effect of an engine at this moment working in Cornwall." Again he says, the ascent of Mont Blanc, is the most toilsome feat that a strong man can execute in two days. The combustion of two pounds of coal will place him on the summit." It is now ascertained by the most experienced engineers of Europe, that the combustion of one bushel of coals well consumed, will raise 100,000,000 pounds weight, which would require the force or united exertion of one million of laborers, supposing each laborer lifted from the earth 100 pounds. Let us suppose one bushel of coal weighs 100 pounds, according to this estimate, one pound of coals properly consumed will raise one million pounds weight, which would require the direct labor of ten thousand men, or the combined strength and effort of the whole population of Cumberland county, each individual lifting as before. If this calculation be continued, we shall find that one ounce of coal in a state of combustion will raise 62,500 lbs. weight, which would require the direct labor of 625 men lifting 100 lbs. each. Marvel not at this, for we all know that the expansive force of a few thimbles full of confined power, will burst a gun barrel of the best temper, and rend in fragments the hardest rock of many tons weight. The United States has in store immense fields of this mineral; it is found at the head of tide water, and on the tops of her lofty mountains; there is throughout the union, and I might say throughout the whole world, proofs of design in the various dispositions of carboniferous beds; they are invariably found in situations most favorable for the comfort and convenience of man. On all our navigable rivers, we have beds of coal, ready for combustion or transportation. Iron, copper, lead, zinc, silver and gold, are treasured up in the vicinity of coal fields, ready to be fused and moulded by the hand of the artist. Wherever the forest is wanting, bountiful nature has, at hand, a substitute in coals; and mountains of this mineral are found in connection with our salt springs. We have then abundant reason to be thankful to the wise creator of the universe for such singular blessings.

In our own state these vegetable fossil remains are invaluable; from the falls of the Kanawha river to its junction with the Ohio, a distance of 100 miles or more, salt springs are found; and here in a chain of mountains following the meanders of this stream, we have the most remarkable accumulations of this vegetable production, within a few rods of the salt works, ready for combustion. In connection with these mountains of coal and fountains of salt water, are inexhaustible beds of iron ore, to be fused and wrought in pump rods, or cast in boilers for the purpose of making salt. Here then, gentlemen, is an astonishing instance of wonderful design in this single group of mineral resources. When the James river and Kanawha improvement is completed, Richmond will probably become a large manufacturing city; her water power is unequalled; she has the advantage in being surrounded and supported by extensive coal fields; her fires are now consuming this fossil, from which she prepares her food, and maintains her forges and furnaces; lamps in a few years, will illume her streets and public halls, from gas derived from coal, that has been buried in the dark recesses of the romantic hills of Powhatan, from time immemorial: together with these advantages, she will daily receive supplies of salt, lime, iron, copper, lead, and other mineral treasures through the western mountains. Her machinery will be propelled by coal combustion and water power, and at some future day she is destined to become the Birmingham of America—a wealthy manufacturing emporium, whose steam engines and water-works, will give employment to mechanics of the various trades; and the sound of the bell, the file and the loom, will be heard in the streets and dissipate gloom. "The smith also sitting by the anvil, and considering the iron work, the vapor of the fire wasteth his flesh, and he fighteth with the heat of the furnace; the noise of the hammer and the anvil is ever in his ears, and his eyes look still upon the pattern of the thing that he maketh; he setteth his mind to finish his work, and watcheth to polish it perfectly." We shall have abundant use for coals, the United States has become a wealthy powerful republic, extending from ocean to ocean, between two and three thousand miles in length, her population hourly increasing, her numerous rivers, long and wide, her lakes large, and sea coast extensive. Her waters are navigated by steam engines, and if we add to these, the steam engines on her railroads, and those employed in the mines and various joint-stock, and other laboring departments, we shall find that they will require a great demand on our coal fields. If steam engines, for one hundred years to come, should increase in the same ratio they have in the last thirty years, there will be in the United States, and on her waters, almost a countless number; and although the western forest is wide and extensive, these engines must ultimately be fed and propelled by coal combustion. The Old Dominion, the mother of this great republic, has partly exhausted her forest, and coal is supplying its place. Let us then, if we regard future generations, hold fast the fossil remains of vegetables, husband our resources, and have legislative enactments prohibiting the exportation of coals, which we all regard as sources of heat and light and industry and wealth.

This earth is to be destroyed by fire, and if I am permitted to offer a single conjecture on this awful subject, it would be, that the most combustible matters will first become the immediate agents of destruction. And whenever the wise creator thinks proper to bring about such an event, how easy will it be for him to set free latent heat, and let loose other chemical agents treasured up in coal fields and all combustible matters, in order to produce general conflagration, that will consume this earth and its furniture, and cause it to pass away like a downy feather in a furnace!

RALEIGH AND GASTON RAIL-ROAD.

Extract from the late annual Report.

The calculations of the entire cost of the work have been carefully made, taking the sums actually paid for such parts of it as have been completed and settled for, and the most accurate estimate that can now be had of the parts remaining to be done. It appears from these calculations, that the work will be done within the estimate of $1,215,000 given in my last report. I therefore refer you to that as the sum which will not be materially exceeded, if at all. This sum exceeds the capital with which the company was originally incorporated, which was $800,000, with the privilege of increasing to $1,000,000. I cannot feel surprised at this excess of the actual cost over a conjectural estimate, made before any survey of the route, and based on data quite vague and inaccurate. Even if an accurate estimate had been made, the rise in prices which occured about the period of the commencement of this work, and which has most unexpectedly continued to the present time, would have been sufficient to account for a great increase of cost.

A comparison of the cost of this work, with the actual cost of the rail-roads in the same range of country in the state of Virginia, and with many roads at the north, will satisfy any inquirer, that it has not exceeded what was justly to be anticipated from the character of the country passed over. I will instance the Richmond and Fredericksburg Rail-Road, both because it approaches nearest to this in character, and because no one at all acquainted with the management of that road, while constructing, has ever doubted that the strictest economy was used. That road cost $12,900 per mile, exclusive of bridging and of locomotives and cars, which is $360 per mile more than the cost of yours, with the same exceptions. The cost of the Richmond and Petersburg road, exclusive of bridges, cars, &c. has been about $21,444 per mile, or $8,904 per mile, more than yours.

The cost of the Petersburg rail-road (not including the Greensville branch, which was much more expensive) with the same exception of bridges, cars and locomotives, has been about $9,700 per mile. This last will be perceived to be $2,840 per mile less than the cost of the Raleigh and Gaston road. This difference is fully accounted for by the circumstances of the case. Labor was hired during the construction of that road at an average price of about $70 per annum; bacon was at 7 to 8 cents, beef at 2 to 4 cents, and corn at 40 to 50 cents per bushel. Rail timber in that section of country is much more abundant than it is on your road, and consequently, could be gotten for about 20 per cent. less. The iron for the Petersburg road cost about $47 per ton, delivered in Petersburg, while that for your road costs about $70 per ton, delivered at Gaston.

Thus it will be perceived that all the elements of cost were, at that time, far less than they have been during the construction of this road.

These are certainly comparisons by no means unfavorable to your work, and when we add that yours is the only one of the roads mentioned, in which rock excavation was encountered to any extent, and the difficulties to be overcome by excavations and embankments are far more considerable than on the cheapest of these other roads, and nearly as great as on the most expensive, it is believed that the board have reason to congratulate themselves on the moderate cost at which their work will be completed.

In making the foregoing comparisons, the item of bridges has been deducted in each case, because that is the only way in which a comparison can be fairly made.

There are five bridges on the Raleigh and Gaston rail-road, most of them in situations of peculiar difficulty. There are few bridges in the world higher than that over Tar river. The aggregate length of the bridges is 3,240 feet, and their cost will be $155,000. When this is included, the cost per mile of the road will be $14,378. The bridging on the Petersburg and on the Richmond and Fredericksburg roads has been far less, while that on the Richmond and Petersburg road has been greater than on this. The cost of the Richmond and Fredericksburg road, when bridging is included, is $13,934 per mile, and that of the Richmond and Petersburg road $31,110 per mile; that of the Petersburg road is $10,110 per mile.

Comparisons equally as advantageous might be made with many other works, but they are deemed unnecessary. I will merely add a list of several rail-roads and their cost per mile, taken from the late report of the president and directors of the Housatonic Rail-Road Company:

Boston and Worcester rail-road,		$37,000	per mile.
Boston and Providence	"	42,000	"
Norwich and Worcester	"	22,000	"
Western	"	34,000	"
New-Jersey	"	45,000	"
Camden and Amboy	"	40,000	"
Columbia and Philadelphia	"	40,000	"
Albany and Schenectady	"	61,000	"
Utica and Schenectady	"	19,000	"
Stonington	"	52.000	"
Hartford and New-Haven	"	20,000	"
Housatonic	"	15,000	"

It should be mentioned that the Housatonic road is just commenced, and that it follows the remarkably level valley of the Housatonic.

As some apprehensions have been expressed that the stock of this road will not be valuable, I hope I may be excused for saying a word on the subject.

It is well known that, since the road went into operation, causes beyond your control have prevented you from offering such facilities to the public as would ensure a large amount of transportation; and yet the amount has exceeded what any one anticipated. No reasoning man can *now* doubt that the tonnage transported over the road will fully equal the expectations of the most sanguine among us.

It has been suggested that the transportation of goods and produce on a rail-road yields but a small profit. Let us examine into this.

It may be seen, by a statement made by the second auditor to the legislature of Virginia, on the 1st of January, 1839, that the state has received dividends on her stock in the Petersburg Rail-Road, amounting, in all, to 36½ per cent. on the whole investment; while the whole amount of interest which the money could have produced, had it been loaned out, would have been 27½ per cent. We see therefore that this is a decidedly profitable stock.

If we examine the sources of revenue on the Petersburg Rail-Road for two years past, we will find that in 1838 their receipts were, from freights $68,410, and from passengers $38,692; in 1837, the receipts were, from freights $48,300, and from passengers $27,161. We see that the greater part of their revenue is from the transportation of goods and produce.

In truth, it is only necessary to have a large amount of tonnage to make it profitable; for the expenses of transportation do not increase in the same ratio with the amount transported. It will require a certain amount of transportation on a road to pay expenses; but after this quantity is exceeded, the transportation becomes profitable. Depots must be kept up at regular intervals, and a certain expense must be incurred at each, however small the quantity of produce which is received may be; but the whole of this expense might remain the same, though the amount of tonnage received were doubled or tripled.

I contend, therefore, that the transportation of goods and produce may be made profitable, and that it will be so on the Raleigh and Gaston Rail-Road.

It is true that the profits arising from carrying passengers are much greater; and I do not think there is any reason to suppose that we will not derive a handsome revenue from this source. The local travel on the Raleigh and Gaston road will be very great, and good stage lines branching off at Henderson and at Raleigh, to the west, will bring a great deal of travel to the road. At present, the difficulty of passing between Columbia and Augusta deters the southern traveller from the main stage line to Raleigh. Could this difficulty be obviated, there are a great many who would prefer this line to venturing out to sea.

Considering all these circumstances, it seems to me that the stock cannot be less than a six per cent. stock, even if the road is never extended south of Raleigh.

If the road should ever be extended to Columbia, S. C., the stock would certainly be one of the best in the union. There is scarcely a man who entertains a doubt of this. The friends of the work know it, and are anxiously endeavoring to find some means of prosecuting this extension. We see every day evidences of the opinions of those whose local interests are opposed to this project.

In a report recently made on an examination for an inland communication between Wilmington and Charleston, by Mr. White, Civil Engineer, he says: "Let us for a moment reflect what will be the consequence of neglecting or delaying the execution of this project. The line of rail-road which is now completed to Raleigh, would be pushed on to Columbia and to Augusta, and then our already languishing portion of the state would be laid prostrate." This shows Mr. White's opinion of the merits of the Metropolitan line as a line of travel. The same report mentions a fact which would be a strong argument in favor of the Raleigh and Columbia road, even if the inland communication between Charleston and Wilmington were effected. He says "that during the sickly season, passengers must be north of Wilmington before sun-down." In short, it is almost too evident to argue, that if Raleigh and Columbia were joined by a rail-road, the whole southern and south-western travel would be brought over the Raleigh and Gaston rail-road.

Let us, for a moment, examine into the chances of this most desirable connection being formed. Surely each stockholder in the Raleigh and Gaston Rail-Road has the deepest possible interest in promoting it. Every stockholder in any of the roads between Raleigh and Baltimore has a deep interest in this project. But no rail-road company, not even the Raleigh and Gaston, has a deeper interest in promoting this work than the Charleston, Louisville and Cincinnati Rail-Road Company. There are two roads now constructing which threaten to take the south-western travel from them. One is the Macon and Savannah, and the other is the Brunswick city and Appalachicola road. If either of these roads is finished, it will take a large portion of the travel from the Charleston and Hamburg road. The only thing which can secure them the travel will be the connection of Columbia and Raleigh by rail-road.

Nor has the Georgia Rail-Road Company less to fear than the Charleston and Hamburg road. The completion of the Macon and Savannah road would draw off the greater part of this travel; and the Brunswick and Florida road would deprive them all of the travel from New-Orleans.

These views are so plain, that the Charleston and Hamburg and the Georgia Rail-Road Company, cannot avoid seeing their danger, and they will certainly do any thing in their power to obviate it.

If there is a rail-road made from Columbia to Raleigh, the Georgia rail-road from Decatur to Augusta, the South Carolina road from Augusta *via* Branchville to Columbia, the Raleigh and Columbia road, the Raleigh and Gaston road, &c. would form a line which would defy all competition. This route would be the shortest that could be travelled. It would pass through a perfectly healthy country, and it would avoid the danger of steamboat navigation at open sea.

The city of Charleston would be very injuriously effected by the travel going through Savannah or Brunswick, for it would then pass Charleston in a steamboat, without stopping, so that neither the city of Charleston, nor the rail-road in which that city is so deeply interested, could be affected otherwise than injuriously, by the completion of this inland route from Charleston to Wilmington, and these other roads in Georgia.

If the Raleigh and Columbia road were completed, the traveller from Charleston itself, instead of going out to sea, would go north through Columbia, and pay a tribute to the Charleston and Cincinnati Rail-Road Company.

In reviewing the whole subject, we see that such a vast amount of capital is dependent for its value on the completion of the Raleigh and Columbia road, that we cannot entertain a rational doubt of its being effected at no distant period.

This being the case, the stock of the Raleigh and Gaston Rail-Road Company would be inferior to none in our country.

All which is respectfully submitted.

CHARLES F. M. GARNETT, C. E.

ON THE PENNSYLVANIA MODE OF GETTING OUT CLOVER SEED.

From the American Farmer.

Observing in the last number a *request* for "information on the best mode of separating the seed from the head or pod of clover." It is a subject that I have paid some attention to for some years past and observed the various machines constructed for the purpose in Chester and Lancaster counties; perhaps two of the first counties that became eminent in the culture of clover in the state of Pennsylvania.

And perhaps as much ingenuity exercised in mechanism for the facilitating the operations of farming as any other section of the union. The present state of cultivation and the limited number of hands to each farm, is a decided proof of the fact.

Much of the seed of clover is now taken out of the chaff by *mills* constructed for the purpose, although considerable is yet trodden out by horses on the floor of their commodious barns. One instance of a late date, I cannot in justice to the inquiry omit.

Being in Philadelphia, and amongst the clover seed dealers, when a *German farmer* arrived with a wagon load of clean seed of the best kind, *seventy-one bushels*, a joint concern between him and his brother—on inquiry, their crop I found amounted to one hundred and thirty bushels, all taken out by treading of horses. The buyers, I also found preferred it to that which was taken out by mills, not being in any way injured by the mill, but by reason of the milled seed not being so perfectly clear: in the operation of milling, the broken fragments of some part of the straw or other substances so near the size and weight of the seed are visible, not being so readily separated with the fan as that trodden out by horses.

Yet I did not find it so objectionable as to make *much* difference in price, but there was a preference in favor of treading.

But as it regards ease and facility to the farmer the mills are preferred; he has only to thresh or tread it off, and separate the chaff and pods completely from the straw and stalks and send it to the mill, he receives the seed fit for the market by paying the toll of one-tenth to the miller for his labor.

Those mills are erected mostly in a situation commanding a circuit of five or six miles round them, and in that distance they get as much work as employs them three or four months through the winter; if well constructed one man and boy are sufficient to attend, except a press of business to require running night as well as day, which will require another hand.

A moderate water power will drive one pair of stones, constructed in the movements on the same principles as for grinding grain, but the stones are of the softer granite kind, as they must not come into close contact like the grinding of grain; in that case they would bruise the seed, which must be carefully avoided by having them well adjusted to their business; the face of the bed stone true and level, the runner true also, and a large eye or hole in the centre, and well hollowed to receive the soft, chaffy substance readily, and a true face of seven or eight inches of the outer skirt or circumference to cause *friction* enough to do the business without any furrows in either of them, but picked rough.

As the seed passes from the stones it is fanned, and what is shed out passes off through a screen or sieve, and the light, dusty part of the chaff is blown out at a window, the remaining heavier chaff that has seed yet remaining in, it is raised by elevators and falls by the stone in order to go through again: all this is done by the water power, and is continually going on with regularity until the parcel more or less becomes finished.

This is the general principle of the mill operation, and perhaps as much as is necessary to say without going into a minute specification.

Any person who wishes to erect mills, I should advise to examine those in operation, as this is the season they are generally at work, and satisfy themselves, as there are various modes of construction though all on the same principle. I have seen them with the under or bed stone running instead of the upper one; it had one advantage, there was no obstruction of the feeding in the seed through the eye of the upper one, yet it might have its disadvantageous complexity in other parts.

Upon every consideration, I am ready to believe where much clover is cultivated the *mill* is decidedly the best plan for dispatch, although an unpleasant, and I might say, unhealthy business for the miller on account of dust.

A neighboring farmer last season threshed off his clover from the straw, the product of *eleven acres*, and carried it to the mill, which produced twenty-two bushels, and left him twenty, or thereabout, after paying the miller's toll, he considered it much easier than to encounter the treading out that quantity in his barn as he was weak handed, his whole force was one man and boy beside himself.

Those who are more than five or six miles from a mill, think the transportation, together with the loss of the offal for manure, to overbalance the gain by milling, and they mostly tread out with horses as they take frosty, winter weather, when snow is on the ground; and this serves for in-door work—all is saved—no toll to pay nor offal lost from the manure heap.

Perhaps information may come on this head from other quarters, it will then be seen how different neighborhoods agree on this business, but if any thing better appears, the editor will please to suppress the foregoing sketch of the subject.

C. KIRK.

Note.—When barns are wanting, the mill must be preferred.

Brandy Wine, 27th, 12th Mo. 1820.

OBSERVATIONS ON THE CHARACTER AND QUALITIES OF HERDS, TIMOTHY AND OTHER GRASSES.

From the American Farmer.

Brandy Wine, 25th, 5mo, 1820.

Esteemed Friend—I am pleased to find the editorial note in last number of the American

Farmer, discriminating between the different kinds of clover as also the timothy, and herds grass; the two latter have been so long cultivated, as to be as I had supposed sufficiently known, but have found them several times spoken of in the Farmer as the same, and lately by our respected agriculturist, T. Pickering.

The timothy grass, with a cat tail head, as some term it, is so general and well known that I should suppose it scarcely needs further description, only the *common hay* of livery stables and taverns through the middle states.

The herds grass is frequently sown and mixed with the former in hay, supposed by many to be equally good; they ripen much about the same time, the top or seed spreads into numerous branches, resembling an oat's head, only more numerous in branches, with an abundance of seed, rising on good soils to 2 and 3 feet in heighth, and is often termed red top; as one kind that is generally cultivated is of a *red* cast, and when in bloom gives it a remarkable red hue, and this kind virtually the same, but void of this red appearance otherways, in every respect the same, as far as I have been able to discover;* as the former, they are both sown in low grounds, and when first introduced bore a high character on account of the advantage of thriving in wet drowned lands better than timothy or any other grass.

This circumstance gave the herds grass a recommendation beyond its real merits—it filled the soil whereon it grew with numerous fibrous roots, so as to make wet grounds more passable with teams in collecting the product of such lands, and at the same time produced a better substitute for the product of those soils, that were too wet for other valuable grasses; by this means it was propagated until the seed being transplanted with hay on to high ground, the disadvantages then began to appear; the numerous roots as before mentioned, would take possession of the soil to the exclusion of every other kind, and every product of a better quality must give way to the strong spreading fibrous roots of the herds grass, seeding so abundantly as to predominate; and the plough so efficacious to destroy every *other kind* is ineffectual as it regards this, without the aid of very dry seasons, and even then it is ineffectual to entirely destroy it; as the fence side and road sides, afford seed enough to introduce it again into the fields.

The excessive predominance of root is objectionable on all high lands, as it lessens the product of the top by the soil becoming so bound with the abundance of roots, as to make it a diminutive production after a few years, and the quality not equal to many other grasses.

The soil becomes parched with drought in hot seasons, under a crop of this or any other that fills the surface with such a multiplicity of fibrous roots; the same remark is applicable to the timothy grass, though not so excessive in roots, yet a piece of land under either of those, when ploughed in dry weather, is remarkably exhausted of its moisture, when compared with the same kind of soil under a crop of either of the clovers or ripple grass, under similar circumstances in every other respect.

Although it ought to be observed, that those former described thirsty exhausters are very deficient in their succulent and nutritive qualities, when compared with several kinds less thirsty for humidity of soil, and abundantly more juicy in their constitution, which, from my observation, I am ready to believe furnishes a richer food both green and dry; but what is remarkable is their requiring less from the soil, (I am fully convinced,) they must receive from other sources, consequently requisition to a greater amount must be made from the surrounding atmosphere; being less in their demand for moisture of soil, and yet retaining so much sap through the dry season, a time when the juices are matured for preservation, appears to me ample proof of furnishing a richer food, when preserved in this state.

The herds grass, therefore, being adapted to wet soils, cannot be of the first quality for hay.

It being a well ascertained fact that *high lands*, from grasses calculated for such situations, judiciously selected, produces the most nutritive provender for cattle either green or dry, but more readily discovered in a dry state, when preserved at the crisis of perfection.

Thy friend,
Caleb Kirk.

ON RECLAIMED MEADOWS.

From the Essex (Mass.) Agricultural Society's Transactions.

In submitting their report, for the current year, the committee have great pleasure in remarking that they have reason to believe that there is an increasing attention paid to these improvements.

The number and length of the statements that have been furnished to the committee, and which are annexed, seem to render it proper that they should abstain from a report any more detailed than is absolutely necessary.

They have viewed the premises described in the several statements, and have examined with attention the claims made for the improvements.

They award the first premium of twenty dollars to Timothy H. Brown, of Saugus, and the second of ten dollars, to William Osborn, Jr. of Salem, for his land in Saugus. For the Committee,

N. W. Hazen.

N. W. Hazen,
Amos Sheldon,
Asa T. Newhall,
Daniel Putnam, } *Committee.*

Timothy H. Brown's statement.

To the Committee on the Improvement of Wet Meadow and Swamp Lands:

Gentlemen—The improvement that I submit to your examination has been made upon between five and six acres of swamp land, situate in the town of Saugus. The mud or soil varies from two to twelve feet in depth. Two years ago, it was so thickly covered with briars and bushes, that a dog would have found difficulty in passing through it. These bushes I mowed and burnt on the ground. There were so many stumps and logs that it was impossible to plough; so I commenced cutting the surface into squares about fifteen inches each way, and then with forked hoes, made very strong, pulled off the sod and cleared out the stumps and logs. Then using the same hoes, cleared out all the small roots, levelled the surface, and placed back the sods the other side up. This part of the work I did in strips of about one rod in width. In August, 1837, I commenced this. In 1836 I mowed the bushes and dug one ditch. The stumps and logs I took out without the help of oxen. Some of the stumps I should judge had nearly half a cord of wood in them. There were a considerable number of trees that had blown down, and the meadow had formed over them. Many of them were perfectly sound, and some measured sixty feet in length. The stumps were very numerous. I found three tier deep, and under the bottom lay a pine log, that had some time or other been on fire. After going over the surface and clearing in the manner I have described, I found the expense to have been, at a fair estimate for the labor, $504.

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* Therefore usually called white top.—*Edit. Am Far.*

In the winter I hauled off the wood and piled it up for coaling. The largest of the small roots I selected for my own fire, the smallest I burnt upon the ground. I commenced harrowing with an iron tooth harrow, as soon as the frost began to come out of the ground. The sods being fastened down by the frost, and the harrow passing over the upper side, they mouldered away as fast as the frost would admit; and when the harrow had got to the depth of the sods, they were worked up pretty fine, the frost below making a bridge for the team to pass on. About the first of last May I began planting with potatoes, without any manure. I cut the seed very fine, and planted the parts near together. I merely marked the hills with a hoe, then a man followed after with the seed, and then another man to cover it. So I made speedy work in planting. I calculated to have the seed, when covered, one inch from the surface. I used sixty-nine bushels of seed, that is, about fourteen bushels to an acre. I should not have seeded so light, had I not felt an uncertainty about obtaining a crop, without the use of manure. There was but one man, among those I consulted, who gave me any encouragement. Many said I should lose my labor. To their astonishment I harvested 927 bushels of excellent potatoes. The expense incident to planting, hoeing, harvesting, &c., including the seed, I estimate at $117. The land is now in a state that I can plough it at pleasure. On a small piece of the land I planted corn, and it ripened well. On a small piece I sowed wheat, but it came to no perfection, either in the straw or grain.

The wood was converted into charcoal. In 1837 I coaled 1201 bushels, which sold in the market for $166 40. In 1838 I coaled 4200 bushels, which sold on the hearth for $333 33, and I ascertained from the purchaser that it sold in Boston market for $630. I sold wood to the amount of $50, and I estimate that which I used for my own fire worth $50 more. I have on hand one hundred cart loads of the bottom of the coal pits, which I value at $75, having had some knowledge of its virtue as a manure.

The account may be thus stated:

Proceeds of coal in 1837, -	$166 40
Do do in 1838, -	333 33
Value of crop of potatoes, at 50 cts. a bushel, - - - -	463 50
Value of ashes for manure, &c.,	75 00
Value of wood sold, - -	$50 00
Value of wood used, - -	50 00
Increased value of the land, it being now worth $125 an acre, and originally thought to be worth only $12 an acre,	565 00
	$1702 23

Labor, &c.

Levelling and clearing the land, &c., - -	$504 00	
Carting the wood and roots,	35 00	
Harrowing, &c., - -	12 00	
Planting, hoeing, harvesting, &c., - - - -	117 00	
Coaling in 1837, - -	40 00	
Coaling in 1838, - -	100 00	808 00

Balance in favor of the experiment, $894 23

I have about two acres more of similar land, that I am managing in the same way. It requires much hard labor, but it yields a fair reward.

Yours with respect,

TIMOTHY H. BROWN.

Saugus, December 7, 1838.

William Osborn, Jr's, statement.

The subscriber presents the following statement to the Committee on Reclaimed Meadows:

The piece of meadow land reclaimed and cultivated by the subscriber lies in Saugus, and contains 4 acres, very wet, and peaty bottom, and admitted of running a pole in some places 10 feet without reaching hard bottom; covered with a large quantity of pine stumps, and a young growth of maples, alders, dogwood, &c.

In the first place I commenced removing the sods and roots from about one-fourth of an acre, and burning the same, but finding the land would not be made sufficiently dry by this process, I turned the sods over the whole piece in the fall (1837), and let them remain for the action of the frost until spring (1838), then had them chopped with large grub hoes, fine enough for planting potatoes, &c. The process of turning over the sods and getting out stumps were both done at the same time; after doing this I run a ditch around the piece, and four ditches across it, 3 feet deep and 4 feet wide, with an outlet sufficient to drain the land at all times last season, to 15 inches below the surface.

I annex a rough sketch of the different lots, which I will describe:

Lot No. 1. Containing one-fourth of an acre, nearest the upland, was cleared in the fall and spring by chopping and clearing the small roots, and made in a good condition for cabbages; manured with compost of loam and manure, and a small portion of unbleached ashes put in each hill. Crop, 50 dozen large cabbages.

Lot No. 2. One-fourth of an acre, pared and burned; sods not fully burned collected into heaps and mixed with stable manure, lime, and salt; in spring chopped fine and spread in drills: planted with ruta baga. Crop, 100 to 150 bushels—mixed with others and I cannot give the exact number.

Lots No. 3 and 4. Sods turned and mud wheeled on from the ditches and spread; raked in rye and grass seed. Crop, 5½ bushels rye, and 18 to 20 cwt. of hay, without manure.

Lots No. 5 and 6. Potatoes, squashes, pumpkins, &c., with coarse barn and stable manure.

Lot No. 7. Corn, potatoes, and squashes.

The amount of manure used on the whole piece, about 6 cords; 2 casks of lime, 1 bushel salt.

Estimate worth of crops, and expenses.

Crops.

327 bushels potatoes, at 60 cts. per bushel, - - - -	$196 20
5½ bushels rye, at $1 25 cts. per bushel, - - - -	6 87
8½ bushels of corn, at $1 per bushel,	8 50
100 " ruta bagas, at 30 cts. per bushel, - - -	30 00
18 to 20 cwt. hay, - - -	12 00
50 dozen cabbages, at 50 cts. per doz.	25 00
2000 lbs. squashes, - - -	20 00
Value of fuel taken off, at least	25 00
	$332 57

Expenses.

Cost of land, - - -	$25 00	
Labor, per contract, - -	86 50	
Ninety-four days by help on farm,	70 50	
Seed potatoes, - - -	15 00	
Rye and grass seed, - -	1 17	
Six cords manure, - -	30 00	
Two casks lime, - -	2 00	
Twenty-two days labor, gathering crops, - - - - -	16 50	$246 67
Net profit, - - - - -		$76 90

The present value of the land I leave for the judgment of the committee.

WM. OSBORN, JR.

December, 1838.

LABOR—THE GREAT WANT OF THE TIDE WATER COUNTRY.

Editorial from the American Farmer.

Taking Maryland as an example for the whole tide-water, slave-holding country, we believe it might be safely affirmed that in the twenty counties of this state, one hundred thousand able bodied laborers might be *profitably* employed in agriculture. That is—one hundred thousand could, with their labor, *produce* as much as would give them comfortable subsistence, supplying abundantly all essential wants, and leave a surplus adequate to the support of a small family for each laborer. The very lands that now lie waste, absolutely waste, in surplus wood and unimproved swamps in Maryland, yielding no interest on the capital which the owner esteems such lands to be worth, would support, and will support four times the present population of Maryland. When we say four times, we do not name that number as the result of any thing like exact calculation, intending only to be *within bounds*. If a wall, like that of China had been built around "the old thirteen" at the time when they resolved to set up for themselves, how different would be their aspect, and how much more highly cultivated, populous, strong and comfortable at this time—but our policy has been, by the prodigal management of our public domain, to set in motion a constant current of emigration, which has not only carried off from the sea-board, all accessions of labor and capital from Europe, but which has drained the old states of their most active and vigorous population. In the low price of the public lands, and the doors left open for speculation and frauds, the most tempting bribes have been offered for the desertion and abandonment of the most glorious climate and country that God ever spread out for man's enjoyment, between the Delaware and the Mississippi east of the mountains. Was ever country so well watered and so abounding in all that land and water can contribute to good living? Yet for want of labor, and of capital to hire it, lands lie waste and unimproved that would feed, clothe, educate and supply with all the necessaries of civilized life, twenty millions of people *without being crowded*—two things appear to be wanting to bring our waste or unoccupied lands into active productiveness—*Capital*—and skill and prudence to *apply it exclusively and faithfully to that object*—how can these two desiderata be supplied—banks have we had over and over again—most of them chartered under a promise of *benefit to the agricultural interest*—scarcely one of them in town or out, that does not bear that *prestige* on its face—read the promises of their notes, and you might swear that Agricola was the God of their idolatry—some with rank imposture display sheaves of the rankest wheat—others hogsheads of tobacco that look as handsome as any that ever were made by a Bowie or a Barbour—but these like the promises of political aspirants before an election—are made *to the ear*—and broken to the hope. The delegates of the landed interest, of whom these charters were obtained, have given themselves and their time too much to party intrigues—the thought and the labor that ought to have been exclusively and conscientiously bestowed in devising means to give activity and profit to capital in real estate, the best of all capital, have been devoted to their own aggrandizement—or in still more disreputable subserviency to the schemes of profligate and ambitious partizans—men who would sooner rend asunder every tie of social and political existence than not be successful in some trick of grovelling ambition and selfishness—some of your *new fledged friends of the dear people!*

Is their no means by which the wants we have indicated can be supplied?—no means whereby the farmer can anticipate what *is in his land*—Credit, which is so much abused in a two-fold sense, is the life-blood of a new country—it enables us, by the application of a skilful industry to make something out of nothing—it is the true elixir whereby we are empowered to open a gold mine in every unimproved swamp, and in every piece of uncleared land—what farmer or planter, of ordinary skill, industry and forecast, that if he had means to hire additional force, even ten times as much as he has, could not support in comfort and pay that additional force and augment the value and productiveness of his estate—but where can he get the capital—if he borrow of a bank, it must be on "*real paper*," to be paid back in a short time, even before his most rational and infallible arrangements for improvement of his land have commenced to operate—as a general rule capital employed for the benefit of agriculture, ought, provided the interest is paid *punctually*, not be called on for any portion of the principal, under 12 months; and then to be gradually returned to the lender at stated times, or sooner, at the option of the borrower, on notice to the lender; the security for the latter always remaining sacred and intangible—what legislative plan can be adopted to accomplish this end? We invite discussion—not in the shape of interminable essays, with long prefaces and short arguments—like the giraffe, all neck and no body; but dissertations that come at once to the point, and so plain and practical that he who runs may read and understand. The reader will have a view of the use and value of capital in *agriculture*, as well as in *manufactures and commerce*, (for it is as indispensible to enterprise and profit in the first, as in the two last) by reading the following account of the expense and profit of improving between "*five and six acres of swamp land*" in Massachusetts*—here was an instance of expenditure in the first cost of improving—carting off the wood and roots, harrowing, planting, hoeing, harvesting, coaling, &c. of $808, equal to about $133 *an acre!* and yet, the operation netted $150 an acre! leaving the *land*, which was before, like thousands and tens of thousands of acres in Maryland and Virginia, altogether unproductive; in a condition probably, to yield hereafter 6 per cent. interest on a capital of $600 per acre! What planter or farmer in the tide water country south of the Delaware, being a man of any enterprise and reflection, who does not feel that he could do something in some degree approaching to this, *if he had capital!* We once heard Mr. Crowninshield, formerly secretary of the navy, say that he gave for land between Boston and Salem one hundred dollars an acre, which it afterwards, (and which he knew would) cost him $50 an acre to clear for the plough—yet he *was well paid*. Ah, if in once glorious old Virginia and Maryland, with their delicious climate, pure water, natural canals to every man's door, and originally fertile soil, we had the *yankee capital* and *labor*, combined with enlightened legislation and genuine public spirit, what a paradise we could make of our country!—now given up to willows and pines—and gambling and politics—not that noble science of politics which teaches us how to use the power which is derived from political association in such manner as shall secure the greatest good to the greatest number—but that odious *game* of party politics, which has for its object the manufacture of great out of little men—the election of *party* supervisors of the road up to *party* supervisors of the union—which teaches the art of procuring fat jobs for the most influential, though they be often the meanest and most ignorant of those who have *influence at elections*.

TO DESTROY YELLOW BUGS.

From the Maine Cultivator.

Many modes of destroying, or preventing the ravages of the yellow bugs that infest cucumbers and melons have been recommended—such as charcoal dust, onion tops, ashes, tobacco juice, &c. but after all *we* never found any thing that could so surely be relied upon as the *fingers*. Visit the plants for a few days every night and morning, when the air is chilly or damp, and kill every one you can find. In a short time you will have destroyed the whole, for they do not travel far. Ordinarially those which are found on plants, are hatched in the same garden. The course we speak of is attended with some trouble; but it is the most sure and effectual one we have ever been able to find out. In the middle of the day, when the sun is out warm, they are very active and are not easily taken; but before breakfast in the morning, and after tea at night, you may destroy all that are on the plants. A few days will make an end of them.

BIRDS ON FARMS.

From the Farmers' Cabinet.

The value of birds in districts settled as thickly as the country of Philadelphia, is appreciated by but few individuals. The beauty of their plumage delights the eye; their song cheers the husbandman in his toil, and gives a charm to the country which no resident can too highly appreciate. The joyous twitter of the swallow and the martin, the song of the blue bird in the spring, the delightful wild notes of the partridge, the lark, the plover, the robin, the thrush, the mocking-bird and the sparrow, awaken an interest in those companions of the farmer, which should impel him to prompt and energetic exertions for their preservation. And let me ask, was there ever a time when these interesting creatures demanded protection more than at the present period? In this country our farms are overrun by parties of worthless boys, and more worthless men, who employ their time in destroying whatever comes in their way. They break our fences, alarm and very often injure our cattle; jeopardize the lives and limbs of our people, and the teams with which they are at work, and many of them do not hesitate to plunder us of our poultry when an opportunity offers. They tread down our crops and injure and annoy us in various ways, and all for the ostensible purpose of destroying the few birds which yet remain with us, which are not worth to them the cost of the powder and shot used in their destruction. When our horses are alarmed and become unmanageable in consequence of their firing, they very often refuse to abstain from what they denominate their sport; and my people have been compelled to quit their work for fear of some serious accident, and still they would persevere. Let us no longer submit to such annoyances and injury, but assert our rights boldly and fearlessly. There is a law which applies to this country, which, if put in force, is abundantly sufficient to afford our birds protection, and to rid us of this intolerable nuisance. The value of birds to a farmer, few are able to estimate. To say nothing of the songs of those warblers, to which I always listen with delight, their value in the destruction of bugs, flies, worms, and noxious insects, is calculable. The swallow, the martin and many others, busily employ themselves in destroying mosquitoes, flies, and other tenants of the air, which annoy us with their sting, or injure us in other respects.

The robin, wood-pecker, sap-sucker, and various other birds, protect our orchards, destroy the worms and insects that there do us mischief; and in their absence there is no little labor required to protect and save the trees which their industry alone would relieve us from. Besides, they do their work better than we can. The presence of a worm in a young tree is only indicated to us by the borings thrown from the orifice made by his entrance, and in removing them with a knife serious injury is done to the tree. The bird, on the contrary, eats the egg, destroys the worm when young, or if he has avoided his vigilance and got under the bark, nature has endowed the two last mentioned with a strong bill with which to strike through the bark, and long and rough tongues with which to drag the lurking villain from his hiding place, and that too with the least possible injury to the tree. Where is the farmer who has not seen his apple trees perforated along the whole length of their trunk by these industrious laborers; and who has not seen such trees distinguished for their health and fruitfulness?

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* See page 391 of Farmers' Register.—Ed.

I can recollect when there were large orchards of healthy trees in parts of this country where it is now almost a folly to attempt to rear an apple tree. Those orchards that are near clumps of wood, may still exist here, but where there is no such harbor for birds designed for their preservation, it is in vain to attempt to rear a tree and preserve it against the destructive ravages of the insects that feed upon it.

The partridge, the plover and lark, too, feed upon insects and labor diligently to promote the interests of the farmer in destroying his enemies. What gives a man more pleasure than when walking over his grounds, he is welcomed by the shrill whistle of the partridge, who, grown familiar with his friends and daily companion, cheers him in his toil and delights him when at leisure?

These birds I have often seen so tame that they would scarcely leave my path, and I remember a covey that during one winter, would frequently come to my gravel walk to receive the feed that was placed there for them. They amounted to about twenty, and I set a high value upon them; but there came upon my farm, during my absence, two gunners with their dogs, and destroyed them all. I assure you I felt the loss of those birds more than I would that of the best horse in my stable.

For myself, I feel in regard to my birds as the ancients did of their household goods; nor can I control a feeling of indignation and a sense of injury, when I see my neighbors or strangers wantonly destroying them upon my premises. There are many depredators in our wheat fields that are destroyed by the partridge, for it is on these he feeds. The lark and the plover do their work in our grass lands. The sparrow, blue-bird, wren and other small birds, labor diligently in our gardens, orchards and pleasure grounds, and they should be welcomed as agreeable visiters by all who reside in the country.

Boxes for their accommodation should be nailed to the trees, and by carefully avoiding to alarm them, and other kind means, they could be domesticated among us. They will otherwise take to the woods and by-places, and we shall be deprived of the pleasure of listening to their cheering songs, and lose the advantages of their incessant labors.

Farmers, think of this. Let us not be unkind to our neighbors, nor deny them reasonable privileges, but do not continue to refrain from expressing a sense of injury at their depredations, and of making known to all the high value we set upon our birds.

A WEEK'S MILKING OF A DURHAM COW.

From the United States Gazette.

The Philadelphia U. S. Gazette gives the following account of the milking of a short-horned Durham cow during the week commencing the 27th of May:

	Morning		*Evening.*	
	Quarts	Pints	Quarts	Pints.
Monday	13	0	12	0
Tuesday	12	1	13	1
Wednesday	13	0	14	0
Thursday	13	0	15	0
Friday	15	0	14	0
Saturday	14	0	15	0
Sunday	15	1½	15	0½
	—	—	—	—
	93	2½	99	1½
			93	2½

Total yield for the week commencing 27th of May and ending 2d of June, inclusive—7 days 104 quarts,

Being within a fraction of 28 quarts per day, and from which were made 14¾ lbs. of butter of the finest quality.

The weather was cold, chilly, and wet, and it was supposed that the quality was less than is usually made under favorable circumstances by the same animal. Our friends in the farming interest will see the necessity of improving the breed of cattle as much as possible. This cow will cost but little more to keep in the best manner, than an ordinary, poor, thriftless creature, that will neither give much milk nor that which is good. —*Boston Daily Times.*

Still better.—It gives us pleasures to record the successful efforts of gentlemen to increase the means of comfort to us, who are cramped in cities; and certainly, the augmenting of milk and butter is one of those exertions which must minister to such comforts. We give the following as the good doings of "*Dairy Maid*," the property of our neighbor James Gowan, of Mt. Airey, Germantown.

Dairy Maid's yield of milk for one week, from Wednesday, 5th June, to Tuesday, the 11th, inclusive.

	Morning.	*Noon.*	*Evening.*	
	Qts.	Qts.	Qts.	Quarts.
Wednesday	12	6	7½	25½
Thursday	12	7	7½	26½
Friday	12¼	7½	7½	27¼
Saturday	13	7¾	8½	29¼
Sunday	13	7½	8½	29
Monday	13	8¼	8	29¼
Tuesday	14	8½	9	31½
		Total		198½

Being an average of more than 28 quarts per day. Butter not yet ascertained. The coming week's milk, which is expected to be greater, from improved feed will be reported. The feed of the past week was pasture, with a basket of grass morning and evening, cut from a head-land of a grain field, except on the evenings of the last three days, when a handful of chopped oats and corn, with shorts from the hay-mow, was added.

The above yield is perhaps unprecedented by any *young* cow in this country under the circumstances, being in the fourth month from calving, and the calf having been with her till within a few days of the trial. The milking at noon was adopted on account of the cow having been brought from the field to her calf, daily, at that time.

Dairy Maid is a beautiful roan, of the improved short-horn Durham stock, bred by Mr. Whitaker, of Yorkshire—imported last fall, and in point and proportions is said to have no superior. Her pedigree, which may be found in the third volume of the "Herd Book," is inferior to no cow on record.

ON BRICKS AND BRICK MAKING.

From Millington's Civil Engineering.

Next in order to natural stone comes brick, which is an artificial or manufactured kind of stone, most extensively used in vast building operations. The brick offers some advantage over stone, arising chiefly from the expedition and ease with which the work may be conducted. No stone can be obtained from the quarry of a shape fit for use in close jointed work, without the tedious process of sawing or cutting it to a fair face; and as stones are large and heavy, there is great loss of time in transporting them, and raising them to their positions in the wall. Stone cannot always be procured, owing to local circumstances, but there are few positions in which brick-earth cannot be obtained within a few miles; and bricks are very portable, are square and ready formed, and if good, and used with good mortar, will produce a better and more durable wall than could be produced by small blocks of hard stone. The stability of a stone wall, with straight joints, depends more on the weight and magnitude of the stones than on the adhesion of the mortar. For as the harder stones are not absorbent, the mortar will not adhere to their surfaces and produce union; while, from bricks being of an opposite character, the brick and mortar, after a short time, become one, and their adhesion is so strong that it is difficult to separate them.

Bricks have, accordingly, been used by all nations from the earliest antiquity. The bricks of Babylon, many of which bear inscriptions, are known at the present day, and many of the admired relics of the ancients, still extant in ruins, exhibit the perfection to which the art of brick-making had arrived in these early days. Some of the structures of Egypt and Persia, the walls of Athens, the Pantheon and Temple of Peace at Rome, and many other buildings are constructed of brick. What is surprising, however, is that many of these bricks, which have stood the test of about 2000 years, do not appear to have been burnt or submitted to the action of fire, to produce their hardness and durability, which can alone be attributed to the extreme dryness and heat of the climate in which they were exposed; for these bricks, on being soaked in water, crumble to pieces, and disclose straws, reeds, and other vegetable matter, from the existence of which it is inferred they have never been submitted to any greater heat than that of the sun. At a later period all the bricks of the ancients were burnt, and it is these that chiefly remain at the present day.

A brick is nothing more than a mass of argillaceous earth or clay, properly tempered with water and softened, so that it can be pressed into a mould to give it form; when it is dried in the sun, and afterwards submitted to such a heat as shall bake or burn it into a hard substance. *This* method of forming bricks puts a limit to their magnitude; for, as the material of the brick *is a* bad conductor of heat, so, if they were made very large, the heat applied externally would never reach the inside so as to bake it properly, without vitrifying and destroying the outside; hence bricks must be confined to such magnitudes as will admit of their being well and equably burnt throughout. In England, the size of bricks is determined by law, and no man can make bricks larger or smaller than the prescribed dimensions. This law is, by many, considered a hardship; but it was established for a two-fold purpose, first, because all bricks made there are subjected to an excise duty or tax of about a dollar a thousand, which tax could not be equalized, unless a size was fixed for the brick; and secondly, it enables a person building, to know the exact quantity of work he can erect for a certain sum of money, and prevents brick-makers taking advantage, by sending out small bricks, or making them so large that their insides may not be hard and well burnt, a circumstance that would produce unsound work, deficient in durability.

This law, as far as regards the determination of the size of the brick, the writer is now *convinced* is good. No regulation appears to exist in the United States, beyond the custom of the place and the caprice of the maker. One man makes a large and full brick, and gets a good price for it, because fewer bricks will do a given quantity of work. Another sells cheaper, but he manufactures a smaller article; and it frequently happens that when a builder cannot get his whole supply from one maker, he is compelled to go to another, when probably his size will not work in with the first, unless a previous bargain has been made as to dimensions. The writer having occasion to use a large quantity of bricks, and having consumed the first quantity delivered, had occasion to order many thousands more from a stranger, for which a written contract was made, and on their delivery he found each new brick an inch and a half shorter than those previously used. On remonstrating, he was told that no dimensions had been specified in the contract; that those delivered were of the usual size, in that part of the country, and no redress could be had; notwithstanding it took nearly one-fourth more bricks to do the same quantity of work, as would have been necessary had they been of the proper, or usual standard size, which, in London, is eight and three-quarter inches long, four and three-eighths wide, and three and three-quarter inches thick; the intention of these dimensions being, that each brick, laid end to end, or every two bricks side to side, with the necessary quantity of mortar between them, shall make exactly nine inches of work; or that four bricks laid one on another, will make a foot perpendicular, or twelve courses to the yard. In Philadelphia, the general run of bricks is eight and a half inches long, and fourteen courses with mortar to the yard perpendicular, thus consuming more bricks and mortar than the English gauge, for the same quantity of work. The young engineer must, therefore, not only attend to the quality, but to the size of bricks, whenever he makes contracts for their purchase.

Although clay has been named as the proper material for making bricks, yet every clay will not answer equally well. Pure clay is quite white, and in burning does not change its color, as may be noticed in tobacco pipes, which are made from it. The brown color of common clay is usually derived from oxide of iron, and this causes the brick to assume a red color when burnt; but as red bricks are not approved or used for outside work in London, where more bricks are made and consumed than in any other part of the world, the brickmakers have contrived means of changing their color in burning to a pale buff, very much resembling the color of Bath-stone, and which gives buildings a much handsomer appearance, and closer resemblance to stone, than would be expected. The mode of coloring is kept as secret as possible, among the manufacturers; but it is partly produced by mixing powdered chalk with the clay, and is, probably, greatly dependent upon the firing of the kiln and the fuel used, since many bricks that exhibit a beautiful and perfect buff hue on their outsides, are red and dark within, if broken.

A stiff, tenacious, plastic clay is unfit for making bricks, as they generally split and fall to pieces in burning. Brickmakers call such clay *strong earth*, and they prefer what they term a *mild earth;* that is, one of less tenacity, and having more the character of loam. When the loamy soil is not found naturally, it is imitated by adding sand in considerable quantity to earth that is too strong. The London brickmakers, in addition to sand, constantly add a considerable quantity of *breeze* to their clay, and they assert that it is this material that gives the peculiar character of color, hardness, and durability, to London bricks. This is somewhat corroborated by the country bricks, made without breeze, being red and of a very different character.

To explain the term breeze, which seems to perform so important a part, it becomes necessary to say that throughout the immense metropolis London, no fuel is used in any of the houses but bituminous or blazing coal, very similar to that known in this country as the coal from Richmond in Virginia. Every house has what is called a dust-hole, in some external part of the premises, into which the ashes and refuse of these fires are put, and the same place is also a depository for any other offal of the house, which must not be thrown into the streets. The parish authorities contract with persons having horses and carts to clear these dust-holes about once a week or oftener, without any expense or trouble to the housekeeper, and the stuff collected is all carried to certain fixed depositories on the outskirts of the town. Here hundreds of men, women, and children, are daily employed in assorting and looking over the mountains of discarded treasure thus brought in, and now become the property of the contractor; apparently worthless in the eyes of the public, but not so in fact, for most of the men who have undertaken this business, in conjunction with that of scavenger or street-cleaner, have, in almost every instance, amassed immense fortunes. The heaps of soil are carefully raked over, and every atom of them passed through several gradations of sifting, with sieves of various fineness. Rags, old iron, metal, bones, and such things as are usually thrown away, mixed with the refuse fuel, form the aggregate of the mass, and all these things are separated and placed in separate heaps. Here the paper-maker gets supplied with much common rag for packing-paper. The old iron is returned to the forge to be manufactured into scrap iron. The hartshorn and ivory-black manufacturer gets supplied with bone; much new and unconsumed coal and cinders are obtained, and this furnishes the only fuel with which all the bricks of London are burnt, while the small and almost incombustible matter, consisting of very small cinders, and new coal, fire-dust, decayed animal matter, and whatever else may be mixed in the mass is *breeze.* This breeze is mixed with the clay, is in a great measure combustible when exposed to the high heat required to burn bricks, and it is said to assist the brick in getting red hot throughout its substance, and otherwise to improve it very materially.

A great deal of care and trouble is necessary in preparing the earth for making good bricks, in order to reduce it to one uniform texture, and to deprive it as much as possible of all stones that might destroy the form of the brick, by breaking in the fire, or becoming vitrified. The bricks of Philadelphia are, in general so good, that we will describe the process used there for making them, and point out where it differs from that pursued near London. The clay in both places is invariably dug in the autumn, and during the winter before frost sets in. The ground is divided out into square allotments called spits, four feet wide and sixteen feet long, which surface, when dug a foot deep, furnishes the right quantity of earth for one thousand bricks, and of course each foot in depth is equivalent to the same quantity. This earth is shifted by barrows to an adjoining piece of ground previously levelled to receive it, and sunk a little under the general surface to prevent water running off. On this it is worked, if in a fit state to make bricks, if not, sand is added in sufficient quantity, according to the judgment of the workman, to make it sufficiently short or mild, and at this period the London brickmaker adds his breeze, which, answering the purpose of sand, it is added in less quantity. It is then cut, slashed, and worked with the spade, adding water to it to soften it; and the quantity of two spits being added together in one heap, sufficient earth to make two thousand bricks is exposed to the frost in each heap, and the more severe the frost is, the better incorporation will take place. Nothing more can be done with it until spring, when the warm weather thaws the heaps, and if the frosting has been effectual no lumps will remain, but the whole will be converted into a uniformly soft and yielding mass. If two wet, the heaps are opened and spread to dry, or if too dry, more water is added, before the last working with the tool, called tempering, in order to render the whole mass uniformly smooth; it is then pressed and patted down, and covered with boards, cloths, or bushes, to prevent the injurious effects of the sun and air, and is now ready for the moulder.

The moulder works at a table or bench in the open air, covered by a shed roof only, to protect him from sun and rain, and the clay is brought to him in a barrow from the tempered heap, and is placed by the boy who brings it on the left hand end of his table; another boy supplies him with dry silicious sand previously dug or provided, and placed on the right hand end of the table, and a third boy stands in front to remove the bricks as fast as they are formed. The mould is formed of mahogany or other hard wood, bound with iron for strength, and cased with iron plate on its top and bottom, or is sometimes lined with thin iron throughout; moulds have been formed wholly of iron, but they are too heavy for expeditious work, and too cold to handle in early spring. The mould is four sides of a box without either top or bottom, as the moulding table forms the bottom, and must be very smooth, on which account, and to prevent wear, it may be covered with sheet-iron. The moulder first covers his table thinly with sand, and cutting off a sufficient quantity of the prepared clay with his two hands, finger-end to finger-end, to form about a brick and a quarter, he kneads it on the table, by pressing on it with the palms of the hands, first drawing it towards him and then pushing it from him, and patting the ends to bring it to a form similar to the mould into which it is to be introduced, (the mould having been previously sanded,) and presses it down with force, so as to fill up all the corners. The superfluous earth is now cut off by running a steel tool like a large thick knife, called a plane, along the top of the mould, when the top of the brick is sanded, and a thin board, called a turning board, as wide as the mould, and three inches longer than it is, is laid over it, and the whole being inverted, the mould may be raised carefully by the two hands, and the soft brick will be left on the turning board, in which state it is taken away. Should any clay remain about the mould, it is now cleaned out and sanded, to prepare it for the next brick. It should here be observed, that the mould must be full half an inch or more longer, and a quarter inch wider and higher, than the brick intended to be produced, as all clay will shrink thus much in drying, and sometimes more.

In order to receive the bricks when moulded, a high and open piece of ground is provided called the floor, and this is formed into what are called ***hacks***. The hacks are perfectly level projections of earth about two feet wide, and rising six or eight inches above the surface of the floor, and are fifty yards or more in length, for receiving the bricks to be dried; and they should run in a north and south direction, in order that both sides of the pile may receive its due proportion of sun-shine, and they must be about four feet apart to allow wheeling with a barrow between them. The boy that receives the bricks from the moulder, holds them by the ends of the turning-board and places them on a barrow constructed for the purpose, with a high raised stage of frame-work, that is level when the barrow is running, and holds twenty bricks. It must run upon planks to prevent concussion to the yet tender bricks. He carries them to a hack and lays them regularly upon it, leaving the turning boards under them until the row is nearly filled, and this allows time for the bricks to dry and become a little hard on the surface, which they will do in half an hour in fine weather. Another who is in attendance at the hacks, takes them up and moves them to the next adjoining hack, previously covered with sand raked smooth; and in doing so, places them on their edges by inclining the turning-board with one hand, and applying the other to the brick, while he slides away the boards to be returned in the empty barrow to the moulder. The soft bricks are thus disposed in an angular manner like a worm-fence, but in no case more than two inches asunder in the widest part, and not touching any where. The row or hack being finished, the bricks are sanded on *their* tops, and if the hack is long, the bricks at the end first put down, will be dry enough to permit a second tier to be laid upon them, and so on until eight tiers or layers are so disposed, which is the greatest number that can be placed without danger of crushing or spoiling the shape of the lower bricks, and this number should not be attempted unless the hacks are long, and the weather fine and dry. The object of placing the bricks in this open manner, is to permit the air to blow through and dry them as effectually as possible, but they must not dry too rapidly, as that will cause them to crack. Should the sun be two powerful, the hack will require shelter, which is obtained by constructing a number of light frames of a kind of basket work of twigs and straw interwoven. They are six feet long, as high as the hacks, and made as light as possible. The straw hurdles are so useful, no brickmaker should be without them; they afford shelter against both sun, rain, and frost, (which are the greatest enemies of the brickmaker in this stage of the business,) or they are set up in angular positions to catch and direct the wind into the hacks, if the bricks dry too slowly. Should violent rains come on which might destroy all the work, the top of the hacks must be thatched, by placing long wheat or rye straw transversely across their tops, keeping it from blowing away by planks laid lengthwise on them. The hacks are raised above the natural soil, for the purpose of keeping the lower tier of bricks out of the wet, should rain occur.

In about a week the bricks will be sufficiently dry for turning, which is done by moving them from the hack on which they were first dried, to the adjacent one left empty to receive them. They are now disposed as before upon their edges, but are put parallel to each other, about one inch apart, and the side that was before downwards is turned upwards. In the second tier or course, each brick is placed over the opening between the two below, and so of all courses that succeed until the eight tiers are again completed. In this manner they still expose considerable surface to the air, and as the bricks have now become tolerably dry, and do not require sun, the last drying hacks are sometimes covered for their whole extent with a slight thatched roof, to protect them from rain; or if the kiln is not ready, they are sometimes moved into a building for safety. The hacks sometimes require turning three or four times before the bricks are sufficiently dry for the kiln, and the drying usually takes from three to five weeks, depending on the state of the weather.

Bricks are always made by piece work near London, where a skilful moulder, having all things in good order around him, will mould and hack from five to seven thousand in a day of fourteen hours work, or about five hundred bricks per hour;

but to accomplish this he will require six hands to wait on him, all of which are children. They supply him with the tempered clay and sand, and water to dip his tools into, remove the bricks as fast as they are moulded, and return the turning boards.

When small quantities of brick are required in a country where they cannot be obtained, or for particular jobs, the clay may be tempered and mixed by placing it on a hard bottom, and working it by a shovel or spade with water, and trampling it in the manner already described for puddling instead of waiting for a frost to break it down. In this case more water must be added than is fit for tempering brick earth, but it can be got rid of afterwards by draining it away, or exposing the earth to dry; when the moulding and drying must be conducted as above described, but on a smaller scale.

In the vicinity of London, where the demand for bricks is enormously great, the large brickmakers adopt a different method to that above described for tempering and preparing their clay, but there is no variation in the manner of moulding and drying upon the hacks. The clay is dug in autumn and frosted as usual; but instead of being piled in ridges or small heaps, the whole is wheeled into one immense pile, as frosting the interior is of less importance when machinery is used. At the breaking up of the frost the clay is carried in navigators' barrows to a mill called a pug-mill, where it is worked by horse power, and incorporated with the necessary quantity of sand, chalk, or other material, and water, which is often pumped up and delivered into the mill, by the same power, in such quantity as will reduce the whole earth to so thin a state that it is just capable of running from an opening made in the bottom of the mill for its discharge. It is received upon a wire sieve or strainer, that stops all stones or foreign ingredients, if their size would prove prejudicial to the bricks about to be made. Two capacious ponds or reservoirs, about three or four feet deep, are formed for receiving this diluted earth, and they are so placed in respect to the mill, that its produce can be discharged into either at pleasure, by means of wooden shoots or spouts. The pugged stuff is conducted into one reservoir until it is quite filled, when it is turned into the other; and while the second is filling, the earthy matter subsides in the first, leaving nothing but clear water at the surface, and this is carefully drawn off by withdrawing pegs, that are placed very close, one below the other, from holes in a thick plank let into the upper part of the reservoir. In this way the water is drained off and runs to waste, leaving a finely divided and most equable mud in the reservoir, which becomes of such consistence by draining, that it can be taken up by shovels, put into barrows, and be taken away. The discharge of the mill is then again turned into the first reservoir, which fills, while a similar draining and removal of the contents of the second is taking place. In this manner the clay is more minutely divided and broken up, or tempered, than could possibly be done by the former process of hand labor, and in its soft state, when first moved, is in excellent condition for receiving finely sifted breeze, or any thing else that may be necessary for improving the quality or color of the brick. After this, all that is necessary for rendering the earth fit for the moulder, is a few days exposure to the air, to make it sufficiently dry for his use; and then the process proceeds exactly as before described, unless indeed a patent moulding machine should be employed, instead of a hand moulder, for forming the bricks, and then the compost is delivered to the machine, of which there are several varieties, said to produce more compact bricks than hand moulding, because greater pressure is exerted to compress the clay into the mould than can be exerted by a man working the whole day through.

All that now remains to be done, is the burning of the bricks, which is an operation of great nicety, because, if not burnt enough they will be soft and worthless, and, if over done, they vitrify, loose their shape, and often run together so as to be inseparable and useless. Accordingly, various methods have been adopted for producing the due degree of firing as it is called. In general, bricks are burnt, both in this country and in England, in a kind of building constructed for the purpose, and called a brick-kiln; but in London, the burning constantly takes place in the open air, the bricks being made up into immense quadrangular piles, consisting of from two to five hundred thousand bricks in each. The built kiln is thought by many to produce the best bricks, or at all events, a larger proportion of good bricks out of any given quantity, and must certainly consume less fuel; but as they are never adopted in the immense brick manufactories of London, where no pains or expense for conducting the concerns in the best and most advantageous manner is spared, this is evidence that there must be some objections to them; for if they possessed real advantages, there can be no doubt but they would be adopted.

A brick-kiln, as usually constructed, is formed of bricks built into a square form like a house, with very thick side walls, and a wide door-way at each end, for taking in and carrying out the bricks; but these doors are built up with soft bricks laid in clay, while the kiln is burning, and a temporary roofing of any light material is generally placed over the kiln to protect the raw bricks from rain while setting, and so made that it may be removed after the kiln is fired. The English kilns are generally thirteen feet long, ten feet wide, and twelve feet high, which size contains and burns 20,000 bricks at once. Wood is the usual fuel used in these kilns, and they are frequently built with partitions, for containing the fuel and for supporting the bricks, in the form of arches, as will be presently described. A brick-kiln has no flue or chimney, as its chief purpose is to direct the heat of the fire through the body of bricks piled above it. To effect this they must be placed in a particular form with great care, and this operation is called setting the kiln, and is performed by one or two men who understand the business, and to whom the raw bricks are delivered in barrows. The form of the setting is pretty nearly the same in the country kilns, or London clamps, except that in the latter, the arches are much smaller, because wood is only used for kindling, and not for burning.

The bottom of the kiln is laid in regular rows, of two or three bricks wide, with an interval of two bricks between each, and these rows are so many walls extending lengthwise of the kiln, and running quite through it; they are built at least six or eight courses high, so as to give the kiln the appearance shown in *Fig.* 120, which is an end view of it. And this is permanent work, or work that remains in the kilns that have fire-places built in their floors, or has to be formed every time the kiln is set, when it has a flat bottom. The intervals between the walls are laid first with shavings, or light and dry brushwood, or any thing that will kindle easily, then with larger brushwood cut into short lengths, that it may pack in a compact manner; and, lastly, with logs of split hickory, or strong burning wood. This done, the over-spanning or formation of the arches is commenced; for this purpose every course of bricks is made to extend an inch and a half beyond the course immediately below it, for five courses in height, taking care to *skintle* well behind, that is, to back up, or fill up with bricks against the over-spanners. An equal number of courses, on the opposite side of the arch, is then set as before, and thus the arch is formed, which is called rounding, and is a nice and important operation, for if the arch fails or falls in, the fire may be extinguished, or many of the bricks above the arch may be broken. The intermediate spaces between the arches are now filled up, so as to bring the whole surface to a level, and then the setting of the kiln proceeds with regularity until it obtains its full height. In setting the kiln, not only in its body, but in the arches also, the ends of the bricks touch each other, but narrow spaces must be left between the sides of every brick for the fire to play through, and this is done by placing the bricks on their edges, and following what is called the rule of three upon three, by brickmakers, reversing the direction of each course as shown at *Fig.* 121. The kiln being filled, the top course is laid with flat bricks, so disposed, that one brick covers part of three others, which process is called platting.

The kilns of Philadelphia are constructed and managed in a manner very nearly according with the above description of the country kilns of England, but they are larger, having an average width of twenty-eight feet in the clear, and are higher; but the bricks are not laid more than thirty-five or thirty-six courses. There are seven arches or firing holes in the end, each two feet high by sixteen inches wide, and the distance between each arch is three bricks. Such a kiln holds 140,000 bricks, and consumes from forty to fifty cords of wood for burning them.

The kiln being built, or finished, the firing succeeds; and this is the most delicate operation, and one that requires practice. The fuel is kindled under the arches, but requires close watching and attendance, for being in a large body, it would burn violently and produce so sudden a heat as would crack and spoil the lowest bricks. To check the burning, the arch holes or mouths are closed with dry bricks, or even smeared with wet clay, in order to prevent the entrance of air, and rapid combustion that would ensue. The fire must be made to smother rather than burn, in order that by its gentle heat it may evaporate away the humidity that remains in the bricks, and produce drying rather than burning. The slow fire requires to be kept up about three days and three nights, by occasionally opening the vents, to supply air and additional fuel, and closing or partially closing them, until the fire gets up, as the workmen call it, that is to say, until it has found its way through all the chinks and openings between the bricks, and begins to heat those at the top of the kiln. To ascertain the progress of the fire, the top of the kiln must be watched, and as soon as the smoke changes color from a light to a dark hue, the drying is complete, and the fire may be urged. The first, or white smoke, called water-smoke, is, in fact, little else but the steam of the water while evaporating, and when that is gone, the real smoke of the fuel succeeds, and now the vents may be opened to admit full draught, and a *strong* fire kept up for from forty-eight to sixty *hours*; *but* the heat must not be white or so strong as *to melt* or vitrify the bricks, and whenever it appears to be increasing too rapidly, the vents must be partially closed. By this time the kiln, if it contains thirty-five courses, will be found to have sunk about nine inches; but the stronger the clay the more it will shrink, and it is by this sinking that the workman knows when the kiln is sufficiently burnt. The experience of burning a few kilns will show how much the clay of that particular place yields to the firing. When it is thus ascertained that the kiln is done, the vent-holes, and all other chinks through which air can enter, are carefully stopped with bricks and clay, and in this state it remains until the bricks are cold enough to be taken down, when they are distributed for use.

From the nature of the above process it will be evident that bricks of very different qualities will be found in the same kiln; for as the fire is all applied below, the lower bricks in its immediate vicinity will be burnt to great hardness, or, *perhaps*, vitrified; those in the middle will be well burnt; and those at the top, which are not only most distant from the fire, but exposed to the open air, will be merely baked, and not burnt at *all*; consequently, if they can be used, they *must* be reserved for inside work, that is not exposed to weather, or they will soon fail and crumble to pieces.

In the London method of open clamp burning, without any kiln, the piling and disposition of the bricks is the same as above described, except that the bottom arches are much smaller, as they are only intended to contain brushwood to produce the first kindling, and not for the future supply of fuel. No fuel is used except the breeze cinders and small coal before described, and this is distributed by means of a sieve, with wires about half an inch apart, over every course as it is laid near the bottom, and over every other alternate course, or every third course higher up in the kiln. The first layers of this fuel are from an inch to an inch and a half in thickness; but they diminish as they ascend, because the action of the heat is to ascend, consequently there is not the same necessity for fuel in the upper, as in the lower part of the kiln. The brushwood in the bottom ignites the lower stratum of fuel, and from the nature of its distribution, the vertical as well as horizontal joints will be filled with it, and thus the fire gradually spreads itself upwards, and the whole clamp is nothing but a mass of bricks and burning fuel. The heat is therefore much more generally distributed throughout the whole mass, and in order to confine it, the entire outside of the clamp is thickly plastered with wet clay and sand, the bottom holes being opened or shut as occasion may require for regulating the draught of air.

Notwithstanding the heat is much more equably distributed throughout this form of kiln, yet the outside bricks all around receive very little advantage from the fire, and are never burnt; but being on the outside they are easily removed, and are reserved for the outside casing of the next clamp that may be built; and being then turned with their unbaked sides inwards, some of them become available. On taking down the clamp, the bricks are assorted, in London, into three separate parcels or varieties, according to their perfection and goodness. Those that are burnt very hard but have not lost their figure or shape, are called *malms*, or malm-facings, or malm-paviors, and are used for facing good work; or for paving, for which their hardness makes them peculiarly suitable. The main body of the clamp produces well burnt and regularly formed bricks called *stocks*, with which the generality of houses are built; and such as are imperfectly burnt, and are soft, are called *place* bricks. These last are used for inside partitions, backing walls that are to be plastered upon, and other work that is neither exposed to the eye or the weather. These several varieties of brick have each a separate price, the best being worth almost twice as much as the worst. If the fire has not been carefully attended to, and has been permitted to get too violent, a few of the lower bricks will become distorted by partial fusion, and may fuse and adhere together, when they are called clinkers, and are useless for building purposes, but form an excellent road material. In this country the names of bricks are different, but derived from the same source, being called hard burnt or arch bricks, body bricks, and soft or salmon bricks; though this last name is generally altered by workmen into sammy. The goodness of a brick is derived from its regular shape and appearance, its tenacity and hardness, its sound, and by its not absorbing water, or being affected by frost. The tenacity and hardness are judged of by striking one brick against another, or letting them fall upon stone pavement. Good bricks should have a sound approaching to that of a metal when so treated, and they ought to ring, and bear a very hard blow with the edge of the trowel, before they divide. If they readily break with a blow, or crumble to dust by a fall, such bricks are of the soft or sammy kind, and are unfit for introduction into a heavy wall, particularly on the outside of it, as they will be sure to be attacked by frost, and crumble to pieces. The absorbency of bricks is judged of by weighing them in the dry state, and then soaking them in water for an hour, and weighing them again. Those bricks that take up the greatest quantity of water, are the least fit for use, when they are to be exposed to its action. The average weight of a sound and dry London stock brick, is four pounds fifteen ounces averdupois.

ON THE HUSBANDING OF FARM-YARD MANURE, AND ON OTHER RURAL SUBJECTS.

To Thos. Wm. Coke, Esq.

Honored Sir—After the minute inquiries into the subject of manures, and the copious elucidation thereof upon chymical principles, carried on and developed by able philosophical men, it will appear presumptuous in me (a humble individual, having no pretension to scientific knowledge) thus taking up the pen, and attempting to follow such high authorities in explanation, and even in some respects advancing opinions at variance with theirs.

But, sir, as the published reports of those eminent men's labors rarely fall into the hands of practical farmers, and are but imperfectly understood by them, I am induced to step forward, and endeavor to express my ideas upon a subject so important to agriculturists, in a plain manner, and not liable to be misunderstood by practical men, to whom the following hints may prove more acceptable, from being the result of practical experience, and not founded on theory alone.

Although I address myself to you, sir, at the present moment, I may in fact be considered as attempting to explain my sentiments to the numerous, intelligent, and highly respectable tenantry upon your extensive *Norfolk* estates, men whose liberality will, I am convinced, excuse me in any harsh expression which may drop from my pen while attempting to deliver my sentiments upon a subject with which their respective interests are inseparably connected. Some men, who have had the advantage of superior information, will consider the greater part of the following observations as extraneous, unnecessary, and perhaps uncalled for; and to such men they actually are so: but they will please to recollect, there are many very meritorious occupiers of land, who have not had the same means of obtaining information upon agricultural subjects, and that to such persons the following hints may be of service; and I may be allowed the privilege of saying, without much fear of contradiction, that it sometimes happens, where farmers have, by means of precept, example, or dint of experience, obtained a competent or even superior agricultural knowledge, they do not always practise to the extent of their information. *A monitor is a wholesome physician for the frailties of human nature, though not always an acceptable one.*

I will now, Sir, enter upon my subject, and will, with your permission (with a view to ease and freedom in expression) consider myself as addressing my remarks to your tenantry.

I will not attempt to enter upon the wide range of manures *generally*, but confine my remarks *more particularly* to what has been aptly termed the Farmer's Sheet Anchor, **Farm Yard Manure.**

My observation and experience justify me in stating, that the husbanding of farm yard manure is (generally speaking) either imperfectly understood, or not sufficiently attended to in the county of Norfolk.

The principal error in the common method of manufacturing farm-yard dung, in Norfolk, originates with the prevalent custom of keeping the dung arising from different descriptions of animals in separate heaps or departments, and applying the same to the land without intermixture, and in an improper state.

It is customary to keep the fattening neat cattle in yards by themselves, and the manure arising from them is of good quality, because the excrement of fat cattle is richer than that of lean ones: fattening cattle are fed with oil-cake, corn, Swedish turnips, or some other rich food, and the refuse and waste of such food thrown about the yard, increase the value of the manure; it also attracts the pigs to the yard. Those industrious and useful animals root the straw and dung about in search of grains of corn, bits of Swedish turnips, and other food, by which means the manure in the yard becomes intimately intermixed, and is proportionally increased in value. The feeding troughs and cribs in the yard should (for obvious reasons) be shifted frequently.

The *store* neat cattle are also kept in yards by themselves. The manure arising from them is of a very inferior description, and it frequently happens that a superabundance of straw is thrown out of the barn at one time, more than the stock in the yard can tread down properly: besides, there is not now the same inducement for pigs to root the straw about in the yard as there was previous to the introduction of threshing machines. The barn door in the *store* cattle yard is now the principal attraction for pigs, and they in a great measure neglect the other parts of the yard, unless where the stock of pigs kept is so large that they are compelled, by the imperious law of necessity, to seek out for their sustenance in a more distant and less productive station than immediately at the barn door.

The horse dung is usually thrown out at the stable doors, and there accumulates in large heaps: it is sometimes spread *a little* about, but more generally not at all, unless where necessary for the convenience of ingress and egress, or perhaps to allow the water to drain away from the stable door. Horse dung lying in such heaps, very soon ferments and heats to an excess: the centre of the heap is burned or charred to a dry white substance, provincially termed *fire fanged*. Dung in this state loses from 50 to 75 per cent. of its value. The diligent and attentive farmer should guard against such profligate waste of property. The remedy is easy, viz. by never allowing the dung to accumulate in any considerable quantities at the stable doors: suppose it was an established rule that every day, as soon as the yard-man has gone through his regular routine of morning's work, such as foddering cattle, feeding pigs, &c. he should take a horse, or some other draught animal, with a light cart, and remove the horse dung from the stable doors, and spread it about the *store* cattle yards. To this plan will be objected the pleas of trouble and expense: in answer I have to say, *trouble* should never be considered by industrious farmers; and I think I can readily prove, there will be no additional expense in carrying the plan into effect. The yard-man having finished his morning's work of foddering cattle, feeding pigs, &c. seldom does more than idle about the yard, and leaning upon his fork until the stock require a second supply of food. His spare time would be more beneficially employed in removing the horse dung, which, at most, would not be more than half an hour's job of a day. There generally is, or always ought to be, about every farm premises, a light cart, for what is called *odd jobs*. These carts will be very suitable for removing the horse dung; and as to animals to draw those carts, there are few farms without having one or more idle horses, or other beasts of burden, upon the establishment; such, for instance, as a favorite old hack-horse, a mule or pony to carry the errand boy, a mare that has a foal, or a horse *a little* lame, and not fit for constant work, an old working ox turned off to fatten, a bull, (where one is kept) a little gentle work would do him good, insomuch it would keep him more quiet in the pasture; or even suppose the master or mistress's gig horse was used occasionally for half an hour of a day at dung cart (when not otherwise wanted) would be of great service in so far as keeping the horse in regular exercise, and by that means prevent fatal accidents which frequently happen where high-spirited gig horses are not kept in constant exercise.

The dung from the feeding hog sties should also be carted and spread about the *store* cattle yard in the same manner as the horse dung.

Opinions are much at variance as to the proper form of dung yards: some theorists recommend the yards to be made so much concave as almost to amount to a well shape, giving as a reason in support of their opinion, that the virtues of dung can only be preserved by being saturated in urine, or some other moisture. Others again assert, that dung yards should be formed convex, and assign as their reason, in support of that *form*, that farm-yard dung should be kept dry. Practical experience points out that a medium between those two extremes is the best, and a yard a little hollowed is the most common shape.

Much has been said and written upon the subject of the valuable properties of urine, and of the weepings of farm-yards, as manures for grass land. It has been recommended to collect the whole wash of the farm-yard in reservoirs, and to convey it from thence into the fields in water carts; but this theory should not be reduced into practice unless it is conjectured that the benefit to be derived from the manure so conducted covers the expense.

It is a good method (where situation will admit of the practice) to collect the wash of farm-yards into tanks, where a body of water can be thrown into it sufficient to effectually irrigate some adjoining piece of grass ground, situate upon a lower level. It is also an advisable method to throw litter, scourings of ditches, and such other refuse into the tanks, in sufficient quantity to absorb the urine and wash off the yards which run into them. Compost, so collected, is admirable top dressing for permanent grass lands, or for young clover lays.

But to revert to the subject of farm-yard dung: it is a common practice (previous to the dung being drawn out of the yards into the fields intended for turnips) to prepare what are called *good bottoms* for the recception of the muck. This is done by collecting considerable quantities of clay, marl or such other material, in heaps where the dung is to be placed—these bottoms are formed to the squares (length and width) of the intended dung heaps, and are from 12 to 18 inches thick. This in done with an idea that the juices of the dung will *descend* into the bottoms. (The fallacy of such reasoning will be pointed out hereafter.) The bottoms being prepared in the fields, the dung is then carted to them from the yards: in this operation, the materials of the bottoms is pressed down very close, by reason of the carts constantly turning upon them when delivering their loads; the carts are tipped up, and the dung shot out. Men are placed at the heaps, who throw the dung up *lightly* with forks to the height of five or six feet making the heaps to cover the square bottoms previously formed. In clearing the yards, it is customary to begin on one side of a yard, going regularly forward, until it is emptied, and then begin on a second, by which means the dung arising from different descriptions of animals is kept apart, and is ultimately applied to the land without intermixture, and as to the horse dung, *the residue of it* which is left from fire-fang and charring, is considered strong dung, and as it is generally understood that a smaller portion of it than of common yard dung will answer the intended purpose, it is usually (as a point of economy) to save carriage, taken to the most distant parts of the farm, and this very frequently without any reference to the nature of the soil (whether clay or sand) to which it is to be applied.

Dung heaps formed in the manner I have described, (when the dung is good for any thing) very soon ferment to a violent degree. The gasses ascend and evaporate: the juices, alas! in place of descending into the hard beaten clay bottom, as was expected, ooze out at the side of the heaps, and are soon dried up and lost. In a short time the fermentation subsides, and leaves the centres of the heaps burned or charred, while the outsides of the heaps are dried up to chips by the natural effects of sun and wind. In this state these miserably mismanaged heaps of dung remain until the near approach of the turnip sowing season; they are then turned over, and the clay bottoms mixed with the dung; a partial fermentation succeeds, (and this turning and mixing the bottoms form the only rational part of the manufacturing process,) for by this improvident system the quality of the dung is not only materially deteriorated, but the quantity very much so, that by the time the farmer has sown half his turnips, he finds his dung expended: he has then recourse to oil-cake, or perhaps sows a part of his turnips without any manure at all. If the soil is of a nature to produce turnips almost spontaneously, there will be a crop even under the worst management; but when not of that happy admixture, and managed as I have before described, it follows as a matter of course that the crop fails; nevertheless the farmer is so much of a philosopher, that he consoles himself with the idea that he has done his duty by the land, believing that it is naturally so *unkind for turnips*, that it would be a perfect miracle if he was to have a good crop of them upon such land.

And here I must beg leave to apologize for the high coloring of the foregoing strictures. It is certainly neither my wish nor intention, more than my duty or interest, to give offence to the respectable body of men to whom I may be considered as applying the foregoing observations; but I consider it in some degree necessary for my purpose to rouse the feelings *to a spirit of inquiry*, and having done so, I ask the candid observer to take an impartial view of the subject, and say whether these things are so? I may be told, that to speak the truth is in some cases a libel; if so, I stand convicted; however, if in speaking the truth in the present instance, I provoke an inquiry which may in the result terminate to the advantage of the parties concerned, I shall consider myself a fortunate railer indeed, however uncourteous my remarks may appear. As it is a failing in human nature to too frequently misinterpret our friends' best intentions, particularly where people cannot bear to be told of their faults; and as it is more easy to see others' faults than one's own, I will take it for granted, that the majority of the readers of the foregoing observations consider them more applicable to their neighbor's system of management than to their own. I am, however, not without hopes, that some few liberal minded, unprejudiced men, will acknowledge at once that the cap fits themselves, and *from such men I entertain the greatest hopes of improvement.*

Having pointed out what I consider the principal errors in the prevalent or common method of husbanding farm-yard manure. I will now endeavor to explain my ideas of what I consider a more perfect system and if I am correct in the opinion I have formed on the subject, I will venture to say, there can be no difficulty in producing *upon the farm* a sufficient quantity of yard muck or compost to manure the whole of the turnip land upon any farm, in a medium state of fertility, cultivated upon the four-course husbandry; and if my premises are correct, the occupier may then reserve the whole of his stipulated quantity of oil-cake for his wheat crop, that description of manure being certainly more adapted to the wheat than to the turnip crop.

As the great object I aim at in the following hints is to improve the quality as well as to increase the quantity of farm-yard manures, I strongly recommend, indeed I consider it indispensably necessary, that all descriptions of farm-yard dung should, in the first instance, be as intimately mixed together as possible, and that particular attention should be paid to the husbanding of the horse dung, which should without fail be removed *daily* into the store cattle yards in the manner I have previously recommended. An abundant stock of pigs should always be kept in the yards—no dry straw should be left to blow about the stack yards; all should be brought into the cattle yards. Nettles, thistles, and other course weeds (not in seed) should be brought into the yards, and not allowed to die and waste in the fields and ditches when they are cut down. The horses kept on the farm should be fed with green food in the yards in the summer months, and they should also be allowed to run loose in the yards in winter, having stables or sheds to go into at pleasure. The yards, stables, and sheds should at all times be kept well littered with straw. The soap lees from the farm-house should be carefully preserved, and thrown upon the dung in the yards—saw-dust, leaves of trees, road scrapings, scourings of ditches, in short, all animal and vegetable substances should be carefully collected and thrown into the farm-yard.

When it is found necessary to empty the dung yards *early in the season*, whether with a view to make room in the yards, to expedite spring work, or employ the teams in unfavorable weather, when they could not otherwise be employed to advantage upon the farm, I recommend that preparations should be made in the usual manner for the reception of the dung heaps in the intended turnip fields, viz. by collecting large heaps of clay, marl, or such other material. The bottoms for the heaps should not be laid above six or eight inches thick of the material, and a large quantity of it to be placed in rows on each side of the bottoms marked out—the dung should then be drawn out of the yards, and placed upon the bottoms, but not in the usual way of throwing it up *loosely to cause fermentation*, on the contrary, by drawing the carts with their loads *upon the heaps*, for the purpose of compressing the dung, and thereby *preventing* *fermentation.* One or two men (according to the number of teams employed, and distance from the yards) should remain constantly at the heaps while the teams are at work, on purpose to spread and level the dung regularly, so as to render the ascent easy for the succeeding teams as they come with their loads.

If the dung has not been previously mixed in the yards, it should be so in drawing to the heaps, by means of taking up a few loads from one yard, and then a few from another, alternately, and even from the same yard the loads of dung should be taken from different parts alternately, by reason that the dung is not of equal quality, nor made with the same regularity, in all parts of the yard.

The coal ashes, road scrapings, and all other collections of manure about the farm house, should also be carried to the dung heaps in the fields; and when the heaps are raised as high as convenient for the horses to draw up, several loads should be shot up at the ends of the heaps, for the purpose of making them up to the square of the centre: the whole heaps should then be completely covered with the marl and clay, or soil previously collected in rows by the sides of the heaps; and if there should not have been a sufficient quantity of material collected in the first instance, more should be got ready without loss of time, so as to effectually enclose the the dung heaps in *crusts*, and they are thenceforth denominated pies. The dung will be preserved in the pies in a very perfect state, with little or no deterioration or diminution without fermentation, and without loss by exhalation or evaporation. The pies should remain in this state until within ten days or a fortnight of the time the manure will be wanted for the turnip ground, when they should be turned carefully over, and the crust, top, bottom, and sides intimately mixed up with the dung: when the turning is completed, immediately plough several furrows of the natural soil all round the heaps, and with the loose earth ploughed up, again coat the heaps all over; the pies will then take a gentle fermentation; the earth intermixed with and covering the dung will absorb the juices and gasses of the dung, and the compost come out in a fine state of preparation for using on the turnip land.

When turnips are sown in the Northumberland ridge system, the drills should be split open, the dung taken from the pies, and spread in the rows, then covered up, and the seed sown immediately in the fresh earth—the whole operation should, if possible, be completed in the same day, when every ridge or drill forms a little hot-bed, to encourage the vegetation of the plants and force them speedily out of the reach of the turnip flies.

When dung is taken out of the yards late in the sping, or only a short time before it is wanted for the turnip ground, the preparation should in some degree differ from the foregoing, because of the pies or compost heaps having less time for incorporating. I recommend the following process for preparing dung late in the spring. First let the bottoms and side heaps of earth be provided, in the same manner as for the winter heaps, but the dung should not be carted upon the heaps to compress them, and prevent fermentation as in winter; on the contrary, the dung should be thrown up lightly with the fork, upon the bottoms, and the side heaps of earth mixed intimately along with the dung, which answers the double purpose of reducing the straw part of the dung to a proper state for applying to the land, and prevents an excess of fermentation in the centre of the heaps. When the heaps are raised sufficiently high, and extended to cover the squares of the bottoms prepared, the natural soil of the field should be ploughed up all round the heaps, and thrown upon them, in the manner heretofore directed; the pies will then take a gentle fermentation, and soon be ready for use. The time required for preparing the manure in this manner must depend upon the *strength* of the dung, and the quantity of the clay or marl thrown up along with it. Experience will soon point out the proper quantity of marl to be applied, and the necessary time for the pies to remain before they are used. Turf turned up for a year preceding, on wastes by the sides of roads, makes excellent pie meat. Good compost heaps applied to land have the effect of renovating soils worn out by arable culture and stimulating manures.

Objections (on the score of expense) will be raised against the system I have recommended, but when it is considered that the greater part of the additional expense is in manual labor, surely that objection should have no weight in the scale, when weighed in balance against the ultimate benefit to the farmer, and the highly creditable method of employing the superabundance of laborers, or excess of population with which the landed interest is at present burthened; in preference to the customary method of supporting the extra laborers and their families as paupers, or which is much the same thing, employing such laborers in what is called repairing the roads, that is (according to the common practice) throwing the *dirt* from the sides into the centre, and thereby creating a *job* for some other persons to throw the *dirt* out again.

This remark leads me to make a few observations on the subject of road making, a subject that although it forms an integral and principal part of rural economy, is but seldom much attended to by those whose interests are most intimately concerned in having good roads.

In a country like Norfolk, where the soil is generally light and dry, and good materials frequently plentiful, much less expense, attention, or ingenuity is required to keep roads in good order, than in districts less favorably circumstanced, and the greater part of the roads in Norfolk are kept in good order; but there are, I am sorry to say, (I speak feelingly) *some very striking exceptions to the general rule.*

The following are prevailing errors in the first formation of roads, viz., omitting to underdrain springy lands, or retentive subsoils, not carrying off (by side drains) the surface water arising for the adjoining lands through which the roads pass, and in neglecting the *inclined plane*, or fall from the water *length-ways*, of the road.

Some eminent scientific men have differed in opinion respecting the form of roads, viz., whether a *concave* or *convex* form is most proper, and both opinions may be supported by well-founded arguments. The vestiges of the Roman roads left in this country indicate that that wise people formed their roads upon the inclined plane and *concave* principle. In modern times the celebrated Bakewell, of Dishley, in Leicestershire, (whose memory will long be revered by agriculturists and breeders of farm stock,) was a great advocate for *concave* roads, as was also his cotemporary and intimate friend Mr. Wilkes, of Measham, in the county of Derby: under the patronage and by the direction of those two eminent men, several well-formed *concave* roads were made and completed in the midland counties. Those roads have now stood the test of many years experience, and the principle on which they were made has been subsequently followed by practical men in those counties. In some instances the hollow or concave roads have failed, where they were made with bad materials, upon wet bottoms, not thoroughly underdrained; but in general they are found to answer much better than high convex roads. because, a heavy-loaded four-wheel carriage, passing along the centre of a *concave* road, presses an equal weight upon the wheels; and as the middle of the road is the lowest, the pressure inclines to the centre, consequently does not shake or loosen the frame of the road. Not so in a convex road, when raised in a high arch (which is frequently the case) for it is impossible to keep a heavy-loaded carriage in a direct line along the middle of such a road, the carriage naturally veers to one side or the other, and the greater part of the weight of the load hangs upon one wheel, which not unfrequently breaks down from such unequal pressure. The road is also cut into deep ruts; those fill with water from the first shower which stagnates in the ruts, and saturates the road to the foundation. The succeeding carriage wheels jam into the ruts, cut them still deeper, shake the road to its centre, if not cut it quite through.

Convex roads ought to be very well made with good materials, and particular attention should be paid to keeping the ruts well filled up, so as to cause the water to fall over *the sides* of the road, for it seldom happens that the projector of a convex road considers it necessary to pay any attention to the fall for the water length ways of the roads: his ideas are rivetted to the principle that water will not stand upon a round road, and so far correct, were it not for the ruts, which for the preceding reasons *must* take place.

A concave road is less liable to have ruts, and requires less attention in keeping in repair than a high convex one: the water naturally runs along the inclined plane from the higher to the lower levels, and then forces its way into the side drains.

There are also many well founded objections against roads being made two much concave, but it is not necessary to mention them at present, as the principal objects of these remarks it to point out and endeavour to correct the prevalent error of raising carriage roads so high in the centre, which is carried to such an excess in some instances as to endanger the lives of the passengers who venture to travel upon them.

The form I recommend is a medium between the two extremes: the road may be a little elevated in the centre, but I consider the principal object which should be attended to in the formation of roads is *the inclined plane*, or fall for the water longitudinally of the road, and this is so absolutely necessary, that where the road has to pass over a level or dead flat (which seldom happens) the bed of the road should be formed with an artificial rise and fall. When the road passes down a long descent of ground, it should be so formed as to lead the water into the side drains at short distance, thereby preventing the water from guttering, which it would do if allowed to run any distance upon the road. When the bed of the road is first formed, it should be well rolled or carted upon, and all irregularities filled up; the hard material should then be laid on in a sufficient body in the first instance, for it is a bad method to begin with a temporary covering, which wonld soon cut through, sink into the bottom, and be lost. The large stones should be carefully broken into small pieces, otherwise they will not cement together. A principal error in the Norfolk method of repairing roads is in laying on field stones without breaking. A moment's reflection will shew that large *round* bodies *cannot*, and that small acute angles *will* unite to form a firm base. When large round field stones are broken small they form acute angles; those joint in with each other, and take an equal bearing of the pressure which comes upon them: not so with unbroken round stones; they always remain loose, and carriage wheels pass *through*, not *over* them, as they ought to do, which causes very great additional draught, and when such stones are put upon high cobling roads it renders travelling very unsafe for a time, until the stones are pushed over the sides of the roads by the carriage wheels, and thereby leaving the centres of the roads in much the same state as before they were attempted to be repaired, with all the time, labor, and expense lost.

Another custom, which cannot be too severely censured, is the imprudent and improvident system of laying bad materials upon roads, when good materials can be conveniently obtained. It is not uncommon to see perfect dirt or sand laid upon roads, which adds fuel to fire, and makes the roads worse than before. The error of this system may be readily explained by calculation.

Suppose the distance from the gravel pit to the part of the road intended to be repaired is one mile; a team, carrying six loads per day, travels twelve miles, exclusive of the distance going to and from work. I calculate the expense of a team of three horses, with a man to drive, including wear and tear, at 14*s.* per day, and the expense of digging and filling the gravel at 4*d.* per load, making the whole expense 16*s.* per day for doing no good whatever, but on the contrary, doing a great deal of injury, viz. by cutting up one part of the road by the carriages passing along it in attempting to mend another part; or, in fewer words, make two holes in trying to stop one.

Now, suppose that an additional 4*d.* per load was allowed for the gravel; it would then be riddled, and I maintain that *three* loads of *riddled* gravel will be more efficacious in repairing roads than *six* loads of unriddled, consequently half the carriage saved.

The comparative statement will then stand as follows:—

	£	s.	d.
To six loads of *unriddled* gravel, and a team for *a day* carrying the same	0	16	0
To three loads of *riddled* gravel, and a team for *half a day*, carrying the same	0	9	0
Saved per day, by using riddled gravel	£0	7	0

Besides less injury done to the roads in carting, and what is still of much greater importance, the farmer having his team only half the time employed upon the roads, and the other part of the time to be beneficially employed upon his farm.

Mending the roads is sometimes used as a plea in extenuation of the injurious practice of picking the stones off the land: but I consider the plea inadmissible, because where there are many gravel stones on the surface, it is a sure indication that a gravel pit may be opened to an advantage at no great distance: but a still greater objection rests in the injury the land sustains from such treatment, particularly light soils, the staple of which is weakened, and the intrinsic value reduced in a very material degree, by having the stones picked off; indeed I affirm, that no stones should ever be picked off sandy or gravelly soils, (and but seldom from any other description of soils,) unless when the stones are so large as to impede the progress of the implements necessary to be used in the cultivation of the soil. Clovers and grasses intended to be mown should always be rolled down at a proper season, after the larger stones are picked off.

It is a disgusting practice, and cannot be too severely censured, to pick the field stones into heaps in the fields, and there allow them to lay, as is frequently the case the year round. This practice is unpardonable in the highly-cultivated and justly-celebrated county of Norfolk, a county to which most others in the kingdom look up to for example. Yet, notwithstanding the general proficiency of the Norfolk farmer, I may justly apply to them the adage of "*use is second nature*," (let it be remembered I speak in general terms, for there are very many exceptions) in respect to the stone heaps; for the farmer rides over his fields amongst those heaps of stones with seeming unconcern, as if unconscious of the injury he has sustained by having had the stones picked off his land in the first instance, and afterwards by their being left in heaps in the fields to destroy the herbage they lay upon.

In this state the stones lay from month to month; nay, from year to year; and there are instances (though not frequent) where the stones are not removed at all, but are spread about again, and ploughed down when the land is to be broken up in preparation for the succeeding crop of corn.

With this severe (I am sorry to say) well founded reproach, I conclude my present remarks. In my hints upon the different subjects I have here alluded to, I have endeavored to point out a few errors, with a view to correct and improve them. Although my remarks appear to be, and are in fact, a little severe, yet I trust the liberal-minded Norfolk farmers will receive them as (they really are) *well intentioned*. Those gentlemen may rest assured, that although I have considered it a duty incumbent upon me to point out a few prominent errors, there is no person more sensible of their general merits than I am, and no one more ready to bear testimony to their indefatigable industry, intelligence, and general good practice as agriculturists, and as this I may safely say, without any fear of being reproached as a flatterer by any person who has read the foregoing remarks.

To Thomas William Coke, Esq.

I beg most humbly to state—You, sir, will, I fear, consider that in the foregoing remarks I have done but imperfect justice to the task I had undertaken.

It is, I acknowledge, a bold measure in me thus venturing to censure any part of the celebrated Norfolk husbandry; the principal improvements of which (as has been very justly remarked by a high authority) were *undertaken, matured, and perfected*, through the instrumentality of your patronage, precept, and *example*.

But although it is generally allowed *that the* system of husbandry followed in Norfolk *is very nearly* perfect, (more particularly where it has felt the immediate effect of your fostering hand,) *I* trust, sir, your liberal mind will excuse me when I venture to say, there are still a few errors or imperfections, which strikes strangers more forcibly than they do the eye of the actual cultivators. Some of those errors have been hinted to me, *and* I have here endeavored to point a few of them out, and to suggest remedies for their improvement.

It will remain for you, sir, to judge of the merits (if there are any) or demerits of my performance, which I now venture to lay before you.

I am, honored sir,

Your very humble and obd't. servant,

FRANCIS BLAIKIE.

MOWING.

From the Farmers' Cabinet.

They who have not been in their youth accustomed to do this work, are seldom found to be able to do it with ease or expedition. But when the art is once learnt, it will not be lost.

As this is one of the most laborious parts of the husbandman's calling, and the more fatiguing, as it must be performed in the hottest season of the year, every precaution ought to be used which tends to lighten the labor. To this it will conduce not a little, for the mower to rise very early, and be at his work before the rising of the sun. He may easily perform half the usual day's work before nine in the morning. His work will not only be made easier by the coolness of the morning air, but also by the dew on the grass, which is cut the more easily for being wet. By this means he may lie still and rest himself during all the hottest of the day, while others who began late are sweating themselves extensively and hurting their health, probably, by taking down large draughts of cold drink to slake their raging thirst. The other half of his work may be performed after three or four o'clock, and at night he will find himself more free from fatigue.

If the mower would husband his strength to advantage, he should take care to have his scythe and all the apparatus for mowing in the best order. His scythe ought to be adapted to the surface on which he mows. If the surface be level and free from obstacles, the scythe may be long and almost straight, and he will perform his work with less labor and greater expedition. But if the surface be uneven, cradley, or chequered with stones, or stumps of trees, his scythe must be short and crooked. Otherwise he will be obliged to leave much of the grass uncut, or use more labor in cutting it. A long and straight scythe will only cut off the tops of the grass in hollows.

A mower should not have a snead that is too slender, for this will keep the scythe in a continual tremor, and do much to hinder its cutting. He must see that it keeps perfectly fast on the snead; for the least degree of looseness will oblige him to use more violence at every stroke. Many worry themselves needlessly by not attending to this circumstance.

Mowing with a company ought to be avoided by those who are not very strong, or who are little used to the business, or who have not their tools in the best order. Young lads who are ambitious to be thought good mowers, often find themselves much hurt by mowing in company.

Mowers should not follow too closely after each other, for this has been the occasion of fatal wounds. And when the dangerous tool is carried from place to place, it should be bound up with a rope of grass, or otherwise carefully secured.

STEAM PLOUGH.

Among the new inventions in France is one which is much talked of among speculators and manufacturers. It is a steam plough of very peculiar construction, with which it is said four miles of ground can be excavated with an engine of only eight-horse power, to the depth of a foot and the breadth of two feet, in a single hour. The projector of the canal from Orleans to Nantes, which, under ordinary circumstances, would require at least five years for its construction, pretends that in one year the whole would be completed by the use of this machine, and that the saving in mere interest of capital would amount to forty thousand pounds sterling. A friend of mine, who is one of the best engineers in Europe, tells me that he has seen the instrument, and that with some ameliorations he believes it would accomplish all that has been stated. The earth as it is turned up is thrown into a sort of sail, which throws it to a distance of sixty feet.—*Letter Corr. Gardener's Gazette.*

To the Editor of the Farmers' Register.

Williamsburg, 1*st July*, 1839.

Dear Sir.—The two papers accompanying this, were compiled for my own gratification. If you think them of sufficient interest for publication they are at your service.

I offer you my friendly salutations,

RICHARD RANDOLPH.

REMINISCENCES OF JAMES TOWN.

Capt. Smith informs us that the first colony landed at Jamestown *for the first time*, on the 13th of May, 1606. It is represented as a peninsula at that time. Misfortune met them at the threshold; for on the return of the first expedition up the river, they found seventeen men wounded, and a boy killed by the *salvages*. Encountering sedition, pestilence and famine, they persevered until they established a town; and commanded respect from the Indians. In January, 1640, it was ordained, that "James Cittie be the chief town," and the governor is to reside there. In 1642 *decent houses* were built in the town. In 1655 Sir William Berkley, governor of Virginia, conveyed to Richard Bennet, esq., "the westernmost of three brick houses," which he built there. A weekly market was established, to be held every Wednesday and Saturday. In 1662 an act of the assembly provides, first, that a town be built at James City; that the town to be built shall consist of thirty-two houses of brick, forty-two feet long, and twenty feet wide, within the walls,eighteen feet high above ground; the walls to be two bricks thick to the water table, and a brick and a half from thence to the roof. The roof to be fifteen foot pitch (a Dutch roof) and covered with slate, or tile. 2ndly, The houses shall be built regularly, one by the other in a square, or such other form as the honorable Sir William Berkley shall appoint. 3rdly, That each county shall build one house. In the same year an act past for building a church; and we may presume that the venerable brick relic of a church, which is now to be seen there, was built in obedience to that act.

The records show that the island extended much farther westward than it does now; and we have good cause to believe that the land on which many of these houses stood, is now under water.

I have before me a manuscript account of Bacon's rebellion, said to have been written by one of the members from Stafford, in the assembly held at James Town in June, 1676. This account may be substantially true; but it certainly contains many errors. It states that Bacon was unanimously chosen a member, and was taken prisoner on his way to that assembly: that he saw him in his seat as a councillor, when the assembly was in session, of which he was a member. There is no instance of a man's being both burgess and councillor at the same time. It also states that Sir William Berkley issued a proclamation against Bacon and others, prior to the 5th of June, 1676, when Bacon went down to take his seat in the assembly. That assembly passed "an act disabling Edward Hill and John Stith to bear office." This act charges *them* with being the *greatest fomenters* of the late disturbances; the writer of the above article states that Edward Hill was a member of that assembly. It is not probable that Bacon would have been so unguarded as to go to the legislature when he was proclaimed an outlaw.

The first overt act "*against his sacred majestie*" was in June, 1676, when he caused James Town to be burnt. The act passed in February, 1677, states, that Lawrence and Drummond were among the most notorious aiders of Bacon. Now Lawrence and Drummond are charged with burning James Town, and it does not appear that they were concerned with Bacon, *prior* to June, 1676. The strongest presumption is, that the proclamation against Bacon was issued *after* his attack on James Town. It is averred that he died in the autumn of that year.

BACON'S REBELLION.

An article under this head, published in the Petersburg Intelligencer, states, that Nathaniel Bacon (called the rebel,) was a member of the council. I doubt it. Where is the evidence? The first official notice of his name, appears in an act of assembly passed on the 5th June, 1676, where he is recognised as general, and commander in chief of the army, raised by an act of assembly, passed two months before.

It does not appear *when* he was commissioned. He lived in the county of Henrico. You will find in the office of the county court of Henrico, a deed from Randolph to Randolph, dated 1st November, 1706, for a tract of land called Curles, lately belonging to Nathaniel Bacon, esq. dec'd., and since found to escheat to his majesty. His confession commences, "I, Nath. Bacon, of Henrico." (See Henning's Stat. at Large, 2nd vol., p. 543.)

Col. Nathaniel Bacon, of York county, was a member of the council in 1658. (See 1st Henning, p. 499.) and of the house of burgesses, in 1659, (see 1st Henning, p. 506,) and president of the council in 1690. (See James City records.) He died on the 16th of March, 1692, in the 73rd year of his age. (See tomb stone on King's Creek.) He married Elizabeth, daughter and heiress of Richard Kingsmill, of James City county; they left no children, and by his will (in general court) he gave his estates to his niece *Abygall* Burwell; his riding horse, Watt, to Lady Berkley, at that time the wife of Philip Ludwell. Lady Berkley was, when Sir William married her, the widow of Samuel Stevens, of the county of Warwick, who settled on her a large estate; and as Sir William left her all his estates, she was very wealthy when she married Col. Ludwell, whose family inherited the mansion at Green Spring, with other valuable and extensive possessions. The tomb stones at James Town are permitted to go to ruin, and the grave of Mrs. Paradice, (the last of the Ludwells, who left a large estate for her heirs,) has nothing to designate it.

Williamsburg, June, 1839.

THE PROSPECTS OF THE MULTICAULIS CROP.

From the Journal of the American Silk Society.

We do not intend, and hope we shall not be suspected of a design to stimulate speculation in morus multicaulis. Our object is to give such information as we are able to collect from different quarters of the country in relation to the growing crop of trees. So far, our information leads us to the conclusion that there will not be more than one-fifth as many trees grown as there have been buds planted. We have information of entire plantations having utterly failed; of others that have not produced more than one tree for every ten buds planted; of others again that bid fair to yield two-thirds, and some few others that will produce one-half. Not more than two plantations have been heard from by us that have yielded seventy-five trees for every hundred buds planted. On carefully comparing these accounts we have arrived at the conclusion, that in the whole country there will be raised not more than one-fifth as many trees as there have been buds planted. We have been repeatedly applied to for the cause of this great failure. As we of course could not have been present every where, we cannot even guess at the cause of failure in any particular case. Some persons have supposed their failures were caused by steeping the cuttings in water before planting. This we do not believe. Cuttings that were too *far gone* before they were steeped would certainly be hastened in their progress to decay by the water; but those that had life enough left to save them under any circumstances would certainly be benefited by it. Gardeners who propagate roses, &c. by cuttings, understand the value of putting the cuttings in water a few hours before planting them. Others attribute the failure to early planting, others to late planting; some to deep planting and some to shallow planting. But the great body of cultivators attribute it to the peculiarly unfavourable season, and bad condition of the cuttings. The two latter reasons we are inclined to think are the true ones. We have seen cuttings planted that were perfectly dry—as dry as our walking stick, and we should as soon have expected a crop of walking canes to have grown from our old *sweet gum* laid in a furrow, as we should a crop of morus multicaulis from some cuttings we have seen planted this spring.

We at present consider the prospect of the prices of trees in the fall to be decidedly good—even better than at this time last year. G. B. S.

LARGE COCOONS.

From the Journal of the American Silk Society.

We were shown a sample of cocoons on the 11th of June, produced by Mr. Richardson, of this city, that exceeded any we ever before saw, for size, weight and texture. There were nine cocoons which weighed collectively, 339 grains an average of 37⅔ grains each, or a fraction less than *one hundred and fifty-three to the pound.* The heaviest cocoons we ever before saw, were 175 to the pound. The above mentioned cocoons were the produce of eggs imported this spring from France, and were of the three kinds called mammoth pale, white, and nankeen. The texture of the cocoons was excellent, and we whould judge 1,200 to 1,300 would be sufficient to make a pound of raw silk, whereas it requires 3,000 cocoons of ordinary quality, to make a pound of raw silk. It should be remarked, that the cocoons had *just* been completed, and therefore the chrysalis was alive, and of course of full weight. G. B. S.

ON THE SELECTION OF MALE ANIMALS IN THE BREEDING OF CATTLE AND SHEEP.

(By the Right Honorable Earl Spencer.)

From the London Farmers' Magazine.

More from wishing to set an example to others, than from any hope that what I myself can suggest will be practically useful, I submit to the English Agricultural Society the results of my experience in an important part of that division of farming, to which my own attention has been particularly applied—I mean the breeding of stock. The part to which the following observations apply is the selection of male animals. A large proportion of farmers breed sheep, and several breed cattle; to all who breed either, this subject is one of great importance.

The object of a certain number is to breed bulls or rams for the purpose of selling or letting them, but that of the majority is to breed oxen or wethers for the purpose of grazing. The first of these classes is very well aware of the importance of selecting good male animals, and profess to spare no trouble and to be very indifferent as to the expense which they incur in obtaining them; but with respect to those whose object it is only to breed oxen or wethers, I am afraid the case is generally very different, and they take very little trouble and expend as little money as possible in procuring the male animals to which they put their females; that is, they consider as a matter of indifference that on which the profitable or unprofitable nature of their occupation mainly depends.

It is admitted by every one that the bodily and constitutional qualities of the offspring are usually similar to those of the parents, either combining in various proportions the qualities of both parents, or taking entirely after one. I should say, as respects cattle and sheep, that, in most cases, the qualities of the male parent predominate in the offspring. I have also observed that the worse bred the female is, the more will this be the case when she is put to a well bred male. This observation was first made, I believe, by the late Mr. Berry, in an essay, for which he received a prize from the Highland Society. He accounted for it thus: a well bred animal means one whose ancestors for several generations have all been good, that is, have all possessed the peculiarities in constitution and shape which it is the object of experienced graziers to obtain in their stock. The characteristic, therefore, of the family of such an animal will be such peculiarities; but the ancestors of a badly bred animal will probably have varied in every possible way, and therefore there will be no distinguishing characteristic in its family; it is consequently most probable that the offspring produced from a cross between two animals so circumstanced will be more like the one in whose family there is a distinguishing characteristic, than the one in whose family no such characteristic exists. The common, but I believe, mistaken notion, that the offspring from the first cross is better than that from any subsequent one, probably arises from the improvement in the first instance being so much more apparent then, for the reason given above, it is likely to be in any generation afterwards. Now it is known to all graziers that the attempt to fatten an animal, who possesses no feeding propensities, produces loss instead of profit. If the above observations are correct, the feeding propensities descend from the sire; it is quite just, therefore, to say that a breeder of cattle or sheep, who considers it a matter of indifference what sort of male animal he uses, does consider it a matter of indifference whether he gains profit or incurs loss.

The first object which any breeder of cattle or sheep must keep in view, whether he intends to breed bulls or rams, or whether his aim is merely to breed oxen or wethers, is that the stock which he breeds shall be healthy. The first thing, therefore, to be considered in the selection of a male animal are the indications by which it may be possible to form a judgment as to his constitution. In all animals a wide chest indicates strength of constitution, and there can be no doubt that this is the point of shape to which it is most material for any breeder to look in the selection either of a bull or a ram. In order to ascertain that the chest of these animals is wide, it is not sufficient to observe that they have wide bosoms, but the width which is perceived by looking at them in the front should be continued along the brisket, which ought to show great fulness in the part which is just under the elbows; it is also necessary that they should be what is called thick through the heart. Another indication of a good constitution is, that a male animal should have a masculine appearance; with this view a certain degree of coarseness is by no means objectionable, but this coarseness should not be such as would be likely to show itself in a castrated animal, because it thus might happen that the oxen or wethers produced from such a sire would be coarse also, which in them would be a fault. Another point to be attended to, not merely as an indication of a good constitution, but as a merit in itself, is that an animal should exhibit great muscular power, or rather that his muscles should be large. This is an usual accompaniment of strength of constitution, but it also shows that there will be a good proportionate mixture of lean and fat in the meat produced from the animal: the muscles being that part which in meat is lean. A thick neck is in both bulls and rams a proof of the muscles being large, and there can hardly be a greater fault in the shape of a male animal, of either sort, than his having a thin neck. I am inclined to say, that in the new Leicester breed of sheep, which is the breed to which I am accustomed, a ram's neck cannot be too thick. Other indications of muscle are more difficult to observe in sheep than in cattle. In a bull there ought to be a full muscle on each side of the back bone; he ought also to have the muscles on the outside of the thigh full, and extending down nearly to the hough. It will seldom happen that a bull having these indications will be found deficient in muscle. With respect to rams, my own observation does not enable me to point out any other indications of muscle except the thickness of the neck, which I have mentioned above; if other farmers are able to point out any, I would only say there is scarcely any thing to which they ought to pay greater attention.

As I am writing for the use of farmers, it is quite unnecessary for me to attempt to give a description of what is considered a well shaped bull or ram; it is also obviously impossible to to express in words what is meant by good handling. It is sufficient to say, therefore, that no male animal is fit to be used at all as a sire whose handling is not good, and that the more perfect his shape is the better. The above observations apply to breeding generally; for whatever may be the sort or size of the animal intended to be produced, there is no doubt but that good health, propensity to fatten, and good shape, in all cases, ought to be aimed at. But there are not only different breeds, both of cattle and sheep, but experienced and very good farmers differ very much in opinion as to which peculiarities of shape and size are to be preferred, even among animals of the same breed. It is, therefore, very desirable before any man commences to breed either cattle or sheep, that he should make up his mind as to the shape and qualities he wishes to obtain, and steadily pursue this object; if he does so, there is very little doubt but that he will succeed in having a herd of cattle or sheep possessing the characteristics which he at first intended they should possess; but if, on the other hand, he breeds at one time with the view of obtaining animals possessing one sort of shape, and at another time with the view of obtaining animals possessing a different sort of shape, the probability is, that his stock will possess neither the one nor the other in any degree of perfection. Having made this decision, he should take care that the individual male animal which he uses shall possess the qualities which he requires. In addition to this, it is of great importance that these qualities should have been characteristic of the family from which the animal is descended; and if he is old enough to have been the sire of any number of offspring, it is of a great deal more importance still that they should possess them. Because all the perfections of shape and quality which the best judge may wish to find in a male animal are, after all, only indications of what the stock got by him will probably be; the seeing therefore, what they really are is much more satisfactory.

There are few breeders of cattle more especially, who breed upon so large a scale as to enable them to keep many male animals at the same time in use. A man therefore, can usually look at the general qualities of the females which he posses, and observe what are the faults most prevalent among them; these he should be particularly careful to avoid in the male which he intends to use. It is sometimes said that the male animal ought to have no faults, and undoubtedly it would be very desirable that this should be the case; but unfortunately, no such animal exists. All a man can do, therefore, is to avoid putting a male and female together whose imperfections are the same, so as not to increase the fault already existing in the stock. If a man breeds upon a large scale, and uses several males at the same time, he can, of course, attend to this more effectually than if he uses only one. In this case, he should select and put together the males and females individually, so as to endeavor to correct any imperfections which either of them show. Most breeders of sheep, indeed, do use more than one ram, and all who pretend to take any praise in improving their flock divide their ewes, so as to put them with the ram who will most probably effect this object. I need not say that those (some of whom, I am sorry to say, still exist) who turn two or three rams of different shapes and qualities into a field with all their ewes, without attempting to make any selection among them, have no right to expect to be successful breeders; and if they do expect it, will certainly be disappointed. I believe the general opinion of breeders is, that it is advantageous to endeavor to correct any fault in the shape of a female by putting a male to her who possesses, in extraordinary perfection, the merit in which she is deficient, but who in some other part of his shape is faulty. My experience leads me to say that this mode of endeavoring to correct a fault is frequently successful. It would be better that none of the females from which a man intends to breed, should be faulty in shape to any considerable degree, but it almost always will happen that some animals, possessing an excellent constitution, good blood, and a great propensity to fatten, and therefore such as the owner would very unwillingly cull, will fail decidedly in some part of their shape. I would say that, when this is the case, it is worth while to try the experiment of putting to them a male remarkable for his perfection in this failing part; and, in my opinion, such a male will be more likely to correct the fault, than one who shows no one part of his shape very superior to the rest. The late Mr. Cline, whose eminence as surgeon is very well known, published a tract upon the breeding of domestic animals which contained, as might be expected, most valuable information. His suggestions are such as ought to be very carefully attended to; but it is probable that his meaning has been *mistaken* in one recommendation which he gives, namely, that in which he is understood to say that it is always desirable that the male should be smaller than the female. When he makes this observation, he is speaking of the crossing of different breeds, and probably only means that in a cross between a large breed and a small one, the male should be taken from the small breed, and the female from the large one. It is hardly possible that he intended to say that in the same breed the male ought to be smaller than the female, because this is contrary to the practice of nature. In every description of land animal with which I am acquainted, the males are of a larger size than the females. The attempt also to follow this advice would undoubtedly, in a few generations, so very much reduce the size both of males and females, as considerably to diminish their value. I can say, from my own experience, that some of the best shaped animals which I have bred have been produced by following a contrary course. I prefer breeding from large females; but if I do breed from one which I think too small I put her to the largest male of good shape that I possess. As one instance among several to prove that this course may be successful, the ox which I showed in the fourth class, at the last Smithfield show, and which obtained the prize in that class, was by the largest bull I have, from a cow so small, that I culled her after she had bred that one calf. It must be admitted that the theoretical reasoning which Mr. Cline adduces in support of this recommendation appears to be very conclusive; but, even in the restricted sense in which I understand it, there is some doubt whether it is practically correct. The most successful cross between two different breeds of cattle, of which I am aware, was the one between a Durham bull and a Galloway Scotch cow, made by Mr. Charles Colling. The produce from this cross sold for enormous prices at his sale, and at the present day a majority of the best short-horned cattle are descended from it. My opinion, then, the result of my own practical experience is, that if a man considers the female animals which he possesses to be smaller than he wishes, he may safely put them to a male of large size, provided he is well bred, of good quality, and is well shaped. But I am bound to add, that I know, in giving this opinion, I differ from the most skilful and successful breeders with whom I am acquainted.

It follows from the above observations, if they are correct, that the first and most indispensable object which all breeders must try to obtain, whatever may be the shape or size they prefer, that the male animal which they select shall possess a strong and healthy constitution. This is absolutely essential; but it is also most conducive to their success that they shall, after due consideration, make up their minds as to the qualities which they wish their stock to possess: that, having made this decision, they shall steadily pursue the object they have in view, and endeavor to select such males as shall be likely to get offspring possessing these qualities; that they shall carefully and candidly examine the females from which they intend to breed, observe the faults, in shape or quality, which prevail among them, and select males who shall possess corresponding perfections. That the safest mode of ascertaining what are likely to be the qualities of the produce from a male in future is, where there is the opportunity, to see what are the qualities of the offspring already produced from them; then, the next to this if, to observe what are the qualities of the family to which he belongs; and that in the case of not having the opportunity of making use of either of these guides, they may assume that it is probable that the qualities of the individual himself, which in all cases ought to be attended to, will, if he is well bred, descend to his offspring.

It has already been said that their are two classes among the farmers who breed cattle and sheep; the one, of those who breed bulls or rams, and the other, of those who breed oxen or wethers for the purpose of grazing only; the above observations are intended to apply to both. But much more attention ought to be paid for the first of these classes in the selection of the animals from which they breed than is absolutely necessary in the other. This is essential to their own interest, because a male animal very often shows faults in his shape which, if he had been castrated, would not have appeared. It frequently, therefore, happens that the produce from a bull or a ram may prove excellent cattle or sheep for grazing purposes only, but may be totally unfit to be kept as the sire of future stock. Their duty also to those who hire or buy from them imposes upon them the obligation to pay the strictest and most minute attention to the qualities of their male animals; more particularly, they are bound not to offer to their customers any one, of the health of which they have any reason whatever to doubt, whether this doubt arises from any weakness of constitution, which may have appeared in the individual himself, or whether it arises from their knowledge of the family from which he is descended. They are bound also, not to keep as males any animals who are not perfectly well bred. It does not follow from this, that a long pedigree is in all cases necessary, although it is generally desirable; but it sometimes happens that a female, of whose pedigree the owner is ignorant, will have produced offspring which have all possessed extraordinary merit, and which have proved themselves good breeders also: a male descended from such a female may be considered perfectly well bred on her side; and will, very possibly, prove a better sire than many whose pedigree is much longer.

In paying this minute attention to their occupation, the breeders of male animals have some advantages not possessed by others; they have generally the opportunity of knowing accurately what are the characteristics of the families of the animals from which they breed, an opportunity not possessed by those who breed only for grazing purposes. In order to make a proper use of this advantage, they ought to keep accurate pedigrees of their cattle and of their sheep, and as far as possible, when they put the males and females together, recollect what have been the respective qualities of the ancestors of each. They have also the opportunity, by using a male cautiously at an early age, of knowing by experiment, whether the stock produced from him is good or bad, before they run the risk of injuring their stock materially by using him largely. This may be ascertained with sufficient accuracy when the produce are very young; for an experienced breeder can judge with tolerable certainty what will be the shape of a calf or a lamb when it grows up by seeing it soon after it is born, and before it has begun to lay on fat. Nor is it necessary to see many of the produce for the purpose of deciding what its general characteristics will probably be. I admit that in saying this I am speaking more from my experience as a breeder of cattle than a breeder of sheep, but I believe the same observation will apply to both. It is certain, however, that seeing four or five calves from a bull ought to be a sufficient guide to the breeder as to whether he will be valuable as a sire or not. Unless there is a family likeness which generally pervades through the produce from a bull, although he may be valuable as the sire of oxen, it will not be safe to use him as the sire of bulls. The seeing, therefore, four or five calves will prove to the breeder whether there is such a family likeness among them, and whether it exhibits itself in such qualities as indicate that when they grow up they will be valuable animals.

There is one failing to which all breeders are liable, but to which the breeder of male animals, from the greater interest attached to his occupation is more peculiarly liable, and against which he ought most carefully to guard himself; this is, too great a partiality for animals bred by himself. In order to guard against this he ought to occupy himself more in looking for faults than in discovering merits in his stock, he ought to listen to every criticism he hears made upon them, even by those whose judgment he does not hold in high estimation—not, of course, with the view of being satisfied at once that the criticism is correct, but with the view of satisfying himself, by accurate and candid examination, whether it is so or not; and he ought frequently to see the stock belonging to other breeders, and fairly compare its merits with those of his own.

I think it most probable that in the foregoing observations nothing will be found which will give new and useful information to practical farmers; but I have been induced to submit them to the English Agricultural Society, because I conceive that one of the great objects of that society is the diffusion of knowledge connected with every branch of farming. The best way in which it can be enabled to effect this object, is by those of its members who have paid attention to any of the divisions of farming operations, communicating to the society the results of their practice and experience. It will then be for the society to circulate, by any means in their power, such of these communications as it shall appear to them are likely to be useful to those engaged in the cultivation of the land. With this view I place this paper at their disposal.

CHINCH BUGS.

From the Raleigh Star.

These mischievous little insects have, we regret to learn, committed great ravages upon the wheat crops in the adjoining counties of Chatham, Orange, Granville and Franklin. In some instances, whole fields have been entirely destroyed, and great fears are entertained that they will next attack the corn,* to which they also are very destructive. The cluster around the stalk in incredible numbers, suck out its substance, and it soon withers and falls to the ground. In some places, to prevent their reaching the corn, for which they are marching in clouds, the farmers dig little ditches and fill them with straw, in which the bugs make a temporary halt, and are burnt—the operation of burning being frequently repeated, during the day. Although the bugs have wings, they travel on the ground. They are natives of the forest; and it is said that where the woods are occasionally burnt, they never become troublesome.

SPAYING HEIFERS.

Gloucester County, Virginia,
February 13th, 1821.

From the American Farmer.

Mr. Skinner.—A friend of mine, observed to me a short time since, that you had requested information on the subject of spaying heifers, and though a subscriber to your useful publication, the American Farmer, I have overlooked it. I will however, give you some account of my experience. Ten or twelve years ago, I began with two in the spring, when they were two years old, and succeeding, I have not failed to spay from two to three each spring since—so that the whole number amounts to between twenty and thirty, and have lost two only by the operation. My most sanguine expectations have been exceeded in the superior excellence of the beef, which is peculiarly delicate. I have had them slaughtered from five to six years of age, and believe they would be larger, and probably better a year or two older; they are thrifty and fattened with facility; the size in much increased by the operation, which is performed in the same manner that sows are treated for the same purpose, but I believe it might be improved (and I mean to try) by forming an inclined plane of soft earth, nearly to an angle of forty-five degrees, against a post for securing the hind legs when the animal is laid on her back, with the heels up, and the head confined below; for the pain must be excessive when suspended by the hams sustaining its whole weight. I have no doubt but the bowels in that situation will be sufficiently out of the operator's way. Two years since, I caused two young cows with their first calves, a month old, to be spayed—they were about two years and nine months old, having, by accident had access to the bull, about the age of two years—my object was to ascertain whether they would continue to give milk as long as they ought to live, agreeable to report; They do continue to give milk, but not equal to what I expected—I am inclined to believe these cows were too young, their udders not sufficiently formed, & which had not grown with their growth—our milkers too, are black women who perform that business carelessly. In my long life, being more than seventy years old, I never new but one free martin, (a barren heifer, that has been a twin with a bull calf) raised in our country—that with it's male twin, a cow of mine produced, four years ago. They are well grown, handsome, and so much alike, they are not readily distinguished from each other; they have been recently subjected to the yoke—the martin has not a feminine appearance, and is at least, equal in strength and *agility to its* twin brother. I have no doubt it will perform well, as would also the spayed heifer, if required for some years, and then make the most valuable beef. The martin has had free access to the *bull* for nearly twelve months—he has never, to the knowledge of any one, noticed her, and her appearance would justify the belief, and also the report that they will not breed. I am,

respectfully your's,
PHILIP TABB.

SILK-CULTURE IN TURKEY.

Miss Pardoe, in a late work, has the following notice of the manufacture of silk, and the culture of the mulberry tree in Turkey:

"Our next job of inquiry was the mode of feeding the silk worms, which produce, in the neighborhood of Broussa, an extraordinary *quantity* of silk. We accordingly visited the establishment of a Frenchman, who exports the raw material to Europe. I was struck by the color of the silk, which was of a dingy white; and learned that, despite all the efforts of the feeders, *they seldom* succeed in producing any other tint, although the worms are themselves of different qualities and colors, varying from a dead white to a dark brown, and are fed with the leaves of both the red and the white mulberry indiscriminately. The most experienced feeders, however, give a decided preference to the wild white mulberry, of which most of the plantations about Broussa are formed. The silk, when first spun, is of a clear, silvery, *brilliant* tint; but submersion in the highly mineralized water of the neighborhood, robs it of its lustre, and reduces it to the dead, dingy color I have mentioned; and I was assured, that in some hundreds of pounds weight of silk, not more than two or three could be met with of yellow.

The Asiatic method of rearing the worm is totally different from that of Europe, and according to the account given to me, much more profitable in its results, as well as simple in its process. The insect has a natural dislike to being handled, which is inevitable where it is fed day by day, and the withered leaves of the previous day cleared away; the discomfort produced by the touch rendering the worm lethargic and retarding it growth. The Asiatics never approach it with the hand; when it is hatched, the floor of the apartment is covered with layers of the mulberry branches to about three or four inches in depth; and upon these the insects are laid, and suffered to feed undisturbed until their first sleep, when they are covered by a fresh supply of boughs similar to the first, through which they eat their way, and upon which they subsist until their next change.

This operation is repeated four times, always at the period when the worm casts its skin; and

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* This they have already done to a considerable extent, it is said, in Mecklenburg and Anson counties.

and on the first appearance of an inclination to spin, boughs of oak, of about four feet in length, stripped of their lower leaves, and planted, if I may so express it, in close ranks in the bed of mulberry branches, from a pigmy forest, in which the insects establish themselves, and wherein they produce their silk. Every crevice of the apartment is carefully stopped to prevent the admission of air, and a fire of charcoal ashes is kept up constantly throughout the day and night.

Whether the mode of feeding operates on the color of the silk, I could not ascertain, though it struck me that the experiment would be worth trying; but meanwhile it appears to be certain that it greatly increases its quantity, and diminishes the labor of feeders. There is scarcely a house in the neighborhood of Broussa, which does not contain several apartments filled with silk worms, whose produce is disposed of to the spinners, of whom there are a considerable number in the city; and the far spreading mulberry woods asume in the height of summer the appearance of stretches of locust-blighted landscape, every tree being left a branchless trunk, without a sign of foliage."

THE EDITOR TO HIS READERS.

The editor of the Farmers' Register is induced again, (and still fruitlessly he fears,) to complain of the general silence of most of those correspondents and contributors who have heretofore given to this journal its greatest value—of the *total* silence, and denial of such aid, by hundreds of other subscribers and readers who could render as good service—and of the almost universal and still growing apathy and carelessness of the southern agricultural community in regard to writing for the public—the only means of sustaining the diffusion of agricultural information—indeed the only means existing of furthering agricultural improvement, and sustaining agricultural interests. With such aid as the present subscribers to this publication can well furnish in writing, there is no question but its original matter, its store, and regular supply especially, of agricultural facts and useful practical information, would make it as efficient for agricultural improvement as its best friends could hope for, or as the most captious critics and fault-finders would insist npon. With but a small proportion of such aid, compared to what the list of subscribers might have furnished, there has been elicited, and made known through the pages of this work, a mass of varied and important information, which has already proved of incalculable value to agriculture. But many of the most valuable contributors have been removed by death—and most of the others have ceased to furnish the aid by which they formerly sustained, through this publication, the great cause of the improvement of southern agriculture; and the few new contributors, though the more welcome and prized because of the rareness of present assistance, do not, by their number, fill the space left void by their predecessors. If a judgment is to be drawn from the continuance of the names of former contributors on the subscription list—from the general support given and continued by subscriptions—and by the absence, or at least paucity, of complaints of want of interest and value in the work—there would be no reason to infer that the Farmer's Register has lost any thing of its claims to, or its hold upon, public favor and support. But, though such complaints have not yet been made, by his readers, so far as he knows, the editor does not hesitate to call attention to this great and deplorable deficiency in the sources of the greatest, if not the sole value of an agricultural magazine. It is not in accordance with the *maxims of the trade* that the proprietor of a publication should be the first to proclaim a falling off in the interest and value of its contents; still the proprietor of this, does not hesitate to do so, even at the risk of the declation affecting the pecuniary and business value of the publication, as much as the deficiency complained of does in regard to its reading and instructing value. He repeats, what has been so often before stated and urged, that it is principally the writings of others, and especially the facts presented by practical cultivators of the soil, that have given value to this work; and that without such aid, and liberally bestowed, neither this nor any other agricultural journal can be long sustained, or deserve to be sustained.

And why should this deficiency of communications exist? Every former contributor since his long passed last communication surely has learned some new facts, or by trial settled some disputed points, the communication of which would be interesting and useful to the agricultural community. Hundreds of individuals on the list of subscribers could be designated, and who prize the work, and heartily wish well to its success, of whom there is not one who could not add to the value of its contents, not only from his stores of previously acquired knowledge, but from the new agricultural facts and opinions learned in almost every month of his continued operations. It is idle and ridiculous to allege that there is any want of materials, and good materials, for regular, continued and increasing communication and discussion, and valuable instruction on agricultural subjects. The field cannot possibly be exhausted—and the more it is cultivated and gathered from, still the more will be offered for new labors, and new gains. As well might it be said that religious *(so called)* periodicals must fail, because all subjects of controversy were exhausted—or that political and partizan papers must want matter for publication, because the dirty game of party had been played out, and no subjects left either for slander and defamation, or fulsome and degrading adulation, and mercenary servility. No one thinks for a moment that the materials for, or the interest in, the exciting and popular subjects of sectarian controversy, or political warfare, can possibly be diminished—and on one or both of these subjects all read, who read any thing. But on agriculture, by which all live, in the improvement of which all are interested, (and the practical operations of which are perhaps the sole profitable occupation of most of the persons who sustain such obfuscating publications as are above referred to,) commands no abiding interest, and the subject is supposed to be soon exhausted. It never can be exhausted; and it is one on which so much light is needed, and so much can be furnished, that the more it is treated of, the more of new matter will be presented for consideration and profitable instruction.

The editor has devoted his labor and his time for nearly seven years to the support of this work and its great objects, to the exclusion and necessary neglect of other things in which his private gain was more deeply concerned, and by attending to which, his interest would have been better served. He has recently abandoned all personal and direct participation in other business, and will continue to devote his energies exclusively to sustaining this publication, heavy as the burden has been and will be, when so little aided by the labors and the encouragement of others. Therefore, should the public support be eventually withdrawn, and the work sink for want of pecuniary as well as literary support, that result would prove a most serious blow to the private interest now so entirely vested in the property. Nevertheless, the consideration of this contingency, which may be hastened and made more sure by predicting its possible occurrence, shall not prevent it being stated in the strongest manner to those who sustain this work by their subscription money, that they must also give it the better aid of their pens, and maintain the interest thus to be produced, or that the publication must become of comparatively little worth, and sink.

During the last six or eight months the Farmers' Register has been very copious, and the contents very interesting and instructive, upon one subject of all-absorbing recent interest in this country—that of silk and mulberry culture. So large a proportion, indeed, of its pages has been devoted to this subject, that, as the editor was sensible, it was out of all proportion to the remaining and more important subjects of agriculture in general. But whose fault was this, but of the individuals who could, and ought to have written on other subjects, and who did not? Communications on cropping, on grass, on cattle, on the improvement of soil, would have been far more prized, if only for their rarity; but very few such have been furnished recently by correspondents; and if the Farmers' Register had not been so much devoted to furthering silk-culture latterly, it could have offered but few original pieces of value on other subjects. It is admitted that the editor's investigations and writings have been principally devoted during this time to silk-culture; and if it is in him an error to enter zealously and heartily in support of every subject which he deems of great interest, it is one which he will always be disposed to fall into. He tried at various times during the last six years to impress upon his readers the importance of silk-culture to Virginia; but until recently there were no materials to operate upon, and his words were unheeded, if not unnoticed. But the iron, which he before struck upon cold and unyielding, *is now at a red heat*, and he has deemed it proper to strike continually while the blows may possibly be effective. He trusts that his and other perhaps more efficient efforts in this cause, have already done much good, and that there is now no doubt of silk-culture being established in this country, and particularly in Virginia, speedily, permanently, and profitably. That alone will be a result of more utility and value to the public than a thousand-fold the cost of this publication. But still the editor has no intention or wish that the publication should be principally devoted to silk-culture, or to any one of the many important branches of agriculture in general; nor can any one justly complain of the preponderance of articles, recently, on silk-culture, unless communications on other subjects had been offered, and received with a less degree of welcome and attention—which certainly has not been the case.

PROMISCUOUS.

For the Farmers' Register.

I make it a rule never to be idle, and whereas I am at this time very nearly in that situation, I write for the Register; and if this shall answer any good purpose, I may at odd times continue the practice. I dislike any thing superfluous, therefore request, that you now take your pencil in hand, and erase any letter, word, or sentence, of such description, lest when I come to read, I may be tormented with my own work, as often as I have been with that of others.

Suckers on Indian corn.—Lands which are rich to a great depth, if not planted thick, will sucker profusely; and in such case the suckers will not damage, but be serviceable, by extracting the repletion, which would otherwise create disease. But if such grounds be planted thick, either in drills, in clusters, no suckers will appear, especially on a deep fallow. So likewise will corn sucker profusely, on a shallow fallow, where the surface is rich, and the under stratum poor; but in this case the suckers will presently be a nuisance, for the soil will not continue sufficient to feed both plants and suckers. If such ground be fallowed deep, no sucker will appear, although thinly planted.

Lodged grain.—No grain will lodge whilst healthy. Diseased seed, diseased ground, diseased atmosphere, insects and dung, will make grain unhealthy. Both very thick, and very thin growing, grain will stand erect: in the first case, any disease being equally divided amongst the numerous plants, the effect is slight; in the second, the air and sun can penetrate in such abundance, that any poisonous matter is extracted or evaporated. If on land already in good heart, a goodly portion of fermented manure be turned in to the depth of a three or four-horse fallow, we might expect a healthy and abundant crop of wheat; and I knew of no reason why the produce in Virginia would not, could not, be equal to that of France, or elsewhere. I believe it to be useful to spread manure on the surface of a shallow fallow and thin soil. Every person of observation will remember that on ordinary and shallow tilled grounds, wheat and other crops start vigorously, and stole profusely; but when the surface has become somewhat exexhausted, and nature has pushed the roots downward, there is a sudden failure, the greater portion of those stoles will perish, and consequently disease is generated.

I have now standing 60 heads of wheat, containing about 2000 grains, which are the produce of one grain; this I intend to sow on ground prepared according to the above ideas; and if the produce hereafter should be one-twentieth part of the present, that would be one-hundred fold; and why not?

Grasses.—I send the heads of a grass which I call the *smooth cock's-foot;* and another which I suppose to be the American *rye-grass*—please let me know what they are?

Sour grasses, and sour weeds, are more numerous this year than I have ever known them—sumach, fern, cheat or chess, sorrels, &c. &c.

Hay.—I never have food sufficient to winter the cattle, which I graze through summer. I have a bank about one mile long, which is clothed with shrubbery, consisting of poplars, ash, mulberry, linn, sassafras, locust, walnut, &c., of which I have strong mind to make hay. My ideas is to break off the tips of the limbs by hand, and cure and stack as usual for grass; but if you Mr. Editor, or any other person, would suggest a cheaper or better plan, I would thank you.

Prices current.—If the editor would state the prices of beef, cows, &c. &c., he would much oblige some of his western subscribers.

Writing.—Many persons do not promulgate information which would prove valuable, because they have no time; many will not write because they fear criticism, and some fear contradiction. Now, I have at all times, about as little time to write as the next man; as to criticism, it would be sport for me ; and as to contradiction, nothing could better please me; because to prove either truth or falsehood, something valuable is apt to be elicited. But I am sorry to believe there are some amongst us who have other, and worse reason for not attempting to enlighten the community, to wit, a desire to be the big man—not the desire to be the greatest amongst the great, but that selfish and mean disposition to keep others in obscurity and ignorance, that he, who is little, may appear big. He who lives alone for his own good, is a brute; and like a brute, will he go down to the grave, to be thought of no more.

Seeds.—I think it a shame for old Virginia to send to the Yankees for their garden seeds. Our mountains are equal to any place in the world, for the production of large and healthy vegetables; and if I thought I could profit, I would try a seed garden.

Improvement of land.—I have made thorough trials of improvement by turning under sorry and ordinary crops of oats, and can recommend it as a cheap and expeditious method. Turn them in when merely half ripe, by which means sudden putrefaction is secured; which putrefaction will be food for the second crop of oats.

In closing, I will remark that I am a subscriber to your paper, that I was raised to farming, that I have read nearly every publication on farming, that my locks are getting gray, and yet I am lacking—lacking—lacking.

Although I am neither ashamed of my name, nor writing, yet request you will not mention my address.

As evidence of my sincerity in asking questions, I pay postage. MOUNTAINEER.

[We are pleased to have the observant, practical, and *working* farmer, that we believe the writer above to be, in our pages, even without a name. He will be always and still more welcome, and still more useful, over his own real signature. We have neither erased nor altered, nor supplied a word.

From our correspondent's proposal to cure leaves for winter forage, it is presumed that he has read and profited by Professor Symonds' account of the practice in Italy, in one of our recent numbers. If not, it is recommended to his notice. Let him, by all means try the experiment, and report the result to the Farmers' Register.

We would, with pleasure, extend the prices current on the covers of the monthly numbers, not only to beef, live-stock. &c., but to many other articles of agricultural products; but the demand of the small town in which we publish, is too limited to show market prices—and to endeavor to obtain them from abroad might lead to deception, more frequently than furnish correct information.

The heads of grasses, in the state received, could not be identified. One seems to be the "feather-grass," of which we know not the botanical name, nor the grade of comparative value.—ED. F. R.]

THE CHINCH BUG IN SURRY.

For the Farmers' Register.

Surry county, July 1st, 1839.

Perhaps it may not be uninteresting to some of your readers, to learn the sad, and lamentable news, that the chinch-bug is now spreading rapidly over every part of our county, and on some few farms destroying every thing before it, and I am afraid, it is destined at no very distant time, to be one of the greatest calamities that ever befel this country. Many farmers (and indeed very reasonably so,) are very much alarmed at the visitation of this great destroyer, not only of the farmer's hopes, but in fact of man's principal and main support of existence. We are now harvesting our wheat crop, in which they got rather too late to destroy it entirely, but on many farms have seriously injured it, many places in the fields being quite destroyed. On following after the scythes, you may see millions of the bugs, of all sizes and colors, red, black and gray, running in the greatest consternation in every possible direction, seeking shelter under the sheaves of wheat, and bunches of grass, which may happen to be near. But all those on the borders of the field, and indeed on every part of it, very soon quit the dry and hard stubble for the more tender and juicy corn or oats, whichsoever may be nearest at hand; and now commences their havoc and dreadful devastation. We see the healthy, dark-green, luxuriant oat, which a few days before looked so beautiful and rich, turn pale, wither and die, almost at their very touch. It would seem exaggeration and almost incredible to state how very prolific this devouring insect is, their increase being so prodigiously great, as to appear to be the work of magic.

In one day and night they have been known to advance fifteen or twenty yards deep in a field, destroying as they proceed. Unless some kind dispensation of providence delivers us from this ruthless enemy to the farming interest, it is impossible to say to what extent their ravages will, and may extend, in the course of a year or two. To us farmers, who are dependent on the productions of the earth, for our every thing, it is truly awful. And if their increase in future is commensurate with the past, it must be but a short time before this section of country will be laid waste by this dreadful depredator, and its inhabitants, reduced to want and misery. Every attempt hitherto made to arrest their progress, or destroy them, has proved abortive. Some have attempted to drive them from their corn by pouring boiling water over them; a remedy, for the corn, as bad as the disease. Others try to stop their ingress to the corn fields by digging ditches around the fields; but with no avail, as they are furnished with wings, in a short time after they are hatched, and of course can easily fly over the ditches. Would it not be advisable always to sow clover, or some other tender grass, with all small grain, to induce the bug to remain in the field after the grain is taken away long enough, to enable the corn crop to get size and age, so as not to be seriously injured by them. I have observed that the older the plant, the much less liable it is to be either injured or attacked. The wheat crop, where it is not injured by the bug, is as promising, and bids fair to yield as plentiful a harvest, as I have ever seen. In fact, this crop is gradually increasing, more having been sown last fall, than for several years past; this desirable change, may perhaps be attributed partly to the use of marl. The growth of the corn crop is very fine; oats likewise; cotton but little, and that very indifferent.

AN OLD SUBSCRIBER.

COMPARITIVE VALUE OF MORUS MULTICAULIS, MORUS ALBA, AND THE CANTON, ALPINE, FLORENTINE AND CHINESE SEEDLING MULBERRY TREES.

For the Farmers' Register.

To the citizens of Virginia, who design making permanent plantations of the mulberry, for the purpose of embarking in the culture of silk, the adoption in the beginning, of such *varieties* of the mulberry as are best suited to our *soils* and climate, is of the highest importance. Enjoying as I do at present the opportunity of comparing the above-named varieties, so as to form a tolerably correct judgment, as to their value for the prosecution of silk-culture *in Virginia*, I will, endeavor to state, with plainness, brevity and candor, the conclusions to which I have been led by a careful examination.

Of all the above-named varieties the "morus multicaulis," justly claims the pre-eminence. Its growth is rapid, and as large as it *should* be for a *permanent* plantation, on light sandy soils that are capable of producing 15 or 20 bushels of corn to the acre. Indeed, it should not be planted on more fertile soils, because at the age of four or five years, after having been headed down, the stalks are liable to be broken down by violent winds. On this point, I speak from very recent experience. It is capable of enduring our hardest winters. In proof of this, the following facts are stated: In the fall of '37 and '38, I dropped in the field a small tree of "morus multicaulis," which remained exposed *root* and *branch* all the winter. It was found, and planted in March, following, and is now healthy, and growing very rapidly. In '38 and '39 other plants were exposed in the same way, which are yet living and doing very well. From those facts some may imagine that the winters in this part of Virginia are very mild; but it is far otherwise. In this region the sassafras and wild pimento, (*laurus benzoin,*) both of which are found in high northern latitudes, have occasionally been killed, and the ground freezes to the depth of fifteen inches. This occurred in the winter of '36 and '37 when we had standing out 900 small plants of "multicaulis" raised from cuttings planted the preceding May, and not more than three or four were lost. I thawed the ground by building a fire, in order that I might get accurate information.

The "morus multicaulis" makes silk of the finest quality, equal, if not superior to the silk from morus alba, and much softer and more lustrous than that produced from morus rubra. I have made very careful experiments on this point, and I confidently assert that the published statement of some northern men, that the silk of "morus multicaulis" is as coarse as that from "morus rubra," or "morus nigra," is without foundation in fact, and evinces either ignorance or want of candor.

Next to the "morus multicaulis," I place a mulberry which I shall call the "Chinese seedling." This is a scarce plant, and cannot for several years at least, come into competition, for purposes of speculation, with the other varieties. I therefore hope I shall escape the suspicion of a *tree selling* communication. It was raised by Mr. C. H. Hunt, of Fredericksburg, from seed which were purchased for multicaulis seed. I have this variety, the "Canton" and the "Alpine," growing from cuttings on similar soil, and I have no hesitation to affirm that it is superior to either. It furnishes leaves that are as large, and they are heavier, more thickly set on the branches, and more glossy. Next to the "Chinese seedling," for light sandy soils, I place the Canton. It bears leaves about half the size of "morus multicaulis," grows very well in such soils, and propagates readily from cuttings.

With respect to the value of morus alba, and the Alpine and Florentine, which are both varieties of the former, I have to say that they will prove valuable to farmers having land that will produce from 80 to 100 bushels of corn to the acre; but on inferior soils they are not worth the expense of cultivation.

I will only add that I consider the Florentine superior to the Alpine.

LAYTON Y. ATKINS.

Stafford co., Va., July 1839.

UNIVERSITY OF VIRGINIA.

List of Graduates of July 4th 1839.

ANCIENT LANGUAGES.

John W. Clay, Huntsville, Ala.
Robert A. Coghill, Amherst, Va.
Muscoe R. H. Garnett, Essex, Va.
Wm. H. Glascock, Huntsville, Ala.
Hunter H. Marshall, Charlotte, Va.
Joseph A. Shanklin, S. Carolina.
James A. Waddell, Staunton, Va.

Latin Language and Literature.

Charles H. Barksdale, Charlotte, Va.
John Staige Davis, University of Va.
Richard Barnes Gooch, Richmond.
Marcellus V. Lanier, Danville,
Carter P. Johnson, Richmond City,
F. R. Rives, Albemarle Co.
John S. Smith, Louisa,
J. D. Thornton, Cumberland,
Thomas H. Watts, Alabama.

MODERN LANGUAGES.

French Language and Literature.

Charles H. Barksdale, Charlotte, Va.
Benj. J. Barbour, Orange, "
Wm. S. Caldwell, New Orleans.
John Staige Davis, University of Va.
Richard B. Gooch, Richmond City.
Muscoe R. H. Garnett, Essex, Va.
William H. Glascock, Huntsville, Ala.
Geo. F. Harrison, Cumberland, Va.
Carter P. Johnson, Richmond City.
Aaron Jeffery, Norfolk Borough.
John C. Meredith, Louisa, Va.
James Morris, Louisa, "
Francis E. Morancy, Louisiana.
Peter B. Prentis, Nansemond, Va.
Wm. L. Pitts, New Orleans.
George F. Pitts, Kentucky.
Francis R. Rives, Albemarle, Va.
John Prosser Tabb, Gloucester, "
Isaac R. Watkins, Charlotte, "

Charles D. Wharton, Goochland, Va.
J. A. Washington, Mount Vernon.

Spanish Language and Literature.

John W. Clay, Huntsville, Ala.
John Staige Davis, University of Va.
Richard B. Gooch, Richmond City.
Wm. H. Glascock, Huntsville, Ala.
George F. Harrison, Cumberland, Va.
Carter P. Johnson, Richmond City.
James Morris, Louisa, Va.
John C. Meredith, do "
Hunter H. Marshall, Charlotte, Va.
Francis R. Rives, Albemarle. "
C. R. G. Slaughter, Charlottesville.
Isaac R. Watkins, Charlotte, Va.
Charles D. Wharton, Goochland, "

German Language and Literature.

George W. Blættermann, U. of Va.
Muscoe R. H. Garnett, Essex, "
Samuel Saunders, Lunenburg, "

MATHEMATICS.

Pure.

John B. Baldwin, Staunton, Va.
Charles H. Barksdale, Charlotte, Va.
John S. Caskie, Richmond City, "
Henry Coalter Cabell, do do.
John Staige Davis, University of Va.
Muscoe R. H. Garnett, Essex, Va.
Wm. L. Harris, Tennessee.
Wm. L. Jones, Mecklenburg, Va.
Carter P. Johnson, Richmond City.
Wm. W. Roper do do.
Geo. W. Randolph, Albemarle, Va.
Chapman Johnson Stuart, Richmond City.
C. R. G. Slaughter, Charlottesville.
Isaac R. Watkins, Charlotte, Va.

Mixed Mathematics.

R. W. Bushnell, Rockingham, Va.

NATURAL PHILOSOPHY.

John B. Baldwin, Staunton, Va.
John L. Burruss, Louisa, "
Robert L. Brown, Nelson "
John Critcher, Jr., Westmoreland.
Lewis W. Cabell, Buckingham, Va.
Willis J. Dance, Powhatan, Va.
William L. Early, Madison, "
Wm. H. Jones, Mecklenburg, "
James Alfred Jones, "
John S. Minor, Albemarle, Va.
James Morris, Louisa, "
Geo. W. Randolph, Albemarle,
C. R. G. Slaughter, Charlottesville.
Samuel Saunders, Lunenburg, Va.
James A. Waddell, Staunton, "
Thomas H. Watts, Alabama.

CIVIL ENGINEERING.

Wm. L. Harris, Tennessee.
John W. Lambeth, Lynchburg, Va.
Nath'l C. Manson, Lynchburg, "
Samuel Saunders, Lunenburg, "

CHEMISTRY.

J. A. J. Bishop, Charlottesville.
John L. Burruss, Louisa, Va.
Richard W. Bushnell, Rockingham.
Jenjamin J. Barbour, Orange, Va.

Lewis W. Cabell, Buckingham, Va.
Eugene Davis, University of Va.
Donald M. Harrison, Amelia, Va.
Wm. H. I'Anson, Petersburg, "
Wm. Sizer, King William, "
Chapman J. Stuart, Richmond City.
Wm. M. Swoope, Augusta, Va,
Lewis Turner, Louisa, "

GRADUATES IN MEDICINE.

With the title of 'Doctor of Medicine.'

Robert M. Anderson, Dinwiddie, Va.
John H. Bell, Rockbridge, "
J. A. J. Bishop, Charlottesville, "
Wm. S. R. Brockenbrough, Hanover.
Charles Carter, "
Levin S. Joynes, Accomack, Va.
Wm. Q. Johnson, Louisa, "
James H Minor, Albemarle, "
George W. Morris, New Kent Va.
Wm. H. Phillips, Albemarle, "
William P. Read, Amherst "
R. A. Scruggs, Buckingham, "
Wm. M. Swoope, Augusta, "
Thos. Woodley, Isle of White "
Austin H. Wright, Richmond City.
F. D. Wheelwright, Westmoreland,
Price M. Watson, Albemarle, Va.

MORAL PHILOSOPHY.

Benjamin J. Barbour, Orange, Va.
Wm. P. Bayly, Accomack, "
R. W. Bushnell Rockingham, "
Henry C. Cabell, Richmond City, Va.
Willis J. Dance, Powhatan, "
Eugene Davis, University of Va.
W. P. Duvall, Tallahassee, Florida,
Richard B. Gooch, Richmond City.
Donald M. Harrison, Amelia, Va.
James P. Holcombe, Lynchburg, Va.
James Alfred Jones, Mecklenburg.
Augustus E. Maxwell, Alabama.
Francis E. Morancy, Louisiana.
Wm. L. Pitts, New Orleans,
Robert R. Prentis, Nansemond, Va.
Samuel Saunders, Lunenburg, "
James R. Sneed, Georgia.
John R. Stapler, "
Lewis Turner, Louisa, Va.
J. A. Washington, Mount Vernon,
Chas. D. Wharton, Goochland, Va.
L. W. T. Wickham, Richmond City.

LAW.

Peter Carr, Albemarle, Va.
C. C. Clay, Jr., Huntsville, Ala.
Thomas O. Dabney, King William.
Robert A. Johnson, Lexington, Ky.
Robert Patterson, Philadelphia.
Henry Spencer, Charlotte, Va.
Robert H. Whitfield, Isle of Wight.

PROFICIENTS IN MEDICAL JURISPRUDENCE.

John B. Baldwin, Staunton, Va.
John G. Cabell, Richmond "
Wm. L. Early, Madison, "
Mathew M. Harrison, Brunswick.
Wm. H. I'Anson, Petersburg, Va,
John R. Stapler, Georgia.
Thomas L. Walker, Albemarle, Va.

PROFICIENTS IN POLITICAL ECONOMY.

Wm. P. Bayly, Accomack, Va.
Richard W. Bushnell, Rockingham.
John D. Bracey, Alabama.
Henry C. Cabell, Richmond City.
Willis J. Dance, Powhatan, Va.
W. P. Duval, Tallahassee, Florida.
James Alfred Jones, Mecklenburg.
Thomas B. Jordan, Georgia.
James Morris, Louisa, Va.
James R. Sneed, Geergia.
J. A. Washington, Mount Vernon.
Thomas H. Watts, Alabama.
L. W. T. Wickham, Richm'd City.

The following students having graduated in the schools of Ancient Languages, Modern Languages, Mathemaics, Natural Philosophy, Chemistry and Moral Philosophy, were declared

"MASTERS OF ARTS OF THE UNIVERSITY OF VIRGINIA."

R. W. Bushnell, Rockingham Va.
Eugene Davis, University of Va.
Donald M. Harrison, Amelia, Va.
James Alfred Jones, Mecklenburg,
Samuel Saunders, Lunenburg, Va.
Charles D. Wharton, Goochland, Va.

WILLIAM AND MARY COLLEGE.

Public exercises and honors of July 4th. 1839.

Orations were delivered by the following gentlemen:

1. William M. Overton, A. B. of Lunenburg, on the probable fate of our institutions.
2. John A. Coke, A. B. of Williamsburg, on the progress of the United States.
3. Richard Ivanhoe Cocke, L. B. of Powhatan, on the former character and present condition of Virginia.
4. Benjaman Blake Minor, L. B. of Spottsylvania, on the circumstances which contribute to the rise of great men from obscuity.
5. Thomas Blackwell, A. B. of Lunenburg, on the probable influence of the U. States on the destiny of the world, together with a valedictory address to the Patrick Henry Society.

After the orations were concluded, the President proceeded to confer the degree of A. B. upon the following gentlemen:

Thomas Blackwell of Lunenburg.
John B. Cary of Hampton;
John A. Coke of Williamsburg;
Wm. H. Fitzhugh of Stafford;
Benjaman F. Garrett of Williamsburg;
Henry Harrison of Charles City;
James B. Jones of Chesterfield;
Alexander Jones of Chesterfield;
Charles W. Montague of Gloucester;
William M. Overton of Lunenbnrg;
Edmund Randolph of Amelia;
Julian C. Ruffin of Petersburg.

And the degree of L. B. on the following gentlemen:

Herbert A. Claiborne, Jr. of the city of Richmond;
Richard Ivanhoe Cocke of Powhatan;
William W. Crump of the city of Richmond;
Thomas B. Donnelly of Williamsburg;

Washington Greenhow of the city of Richmond;
Edward Gresham of King & Queen;
J. Warren Griggsby of Rockbridge;
Benjaman Blake Minor of Spottsylvania;
John Poindexter, Jr. of Louisa;
Austin M. Trible of Essex.

Certificates of proficiency, under the College seal, were then awarded to the following gentlemen:

Benjaman E. Booth of Surry, Junior Mathematics.

James E. Brooks of Richmond, Chemistry.

Thomas H. Bullock of Lynchburg, Junior Moral Course, Chemistry and National Law.

Nathaniel C. Cocke of Prince George, History, Natural Philosophy, Mathematics and Metaphysics.

Walter W. Coke of Williamsburg, Chemistry and National Law.

George P. Coleman of Williamsburg, Junior Moral Course, Chemistry, Natural Philosophy and National Law.

Daniel A. Daly of Mecklenburg, Natural Philosophy and Engineering.

W. R. Drinkard of Petersburg, Mathematics and National Law.

G. R. Dupuy of Petersburg, 1st half Junior Moral Course, Junior Mathematics, Chemistry and National Law.

Charles J. Fox, King & Queen, Metaphysics.

John H. Fox of York, History and National Law.

Wm. W. Glenn of Baltimore, Junior Mathematics and National Law.

Wm. H. Gwathmey of King William, History, Political Economy and Metaphysics.

James Hamilton of North Carolina, Junior Moral Course, Chemistry, National Law and Metaphysics.

Thomas Harrison of Sussex, Junior Moral Course, Chemistry, National Law, Mathematics and Engineering.

W. S. Hawkins of North Carolina, Chemistry.

A. Hill of Petersburg, History.

A. L. Jarvis of Matthews, Chemistry.

Wm. R. Johnston of Fredericksburg, Junior Mathematics.

Edmund W. Jones of North Carolina, National Law.

Warner T. Jones of Gloucester, Political Economy and Metaphysics.

Benjaman Irby of Nottoway, History, Chemistry, Mathematics and Metaphysics.

I. W. Irby of Nottoway, Junior Mathematics and National Law.

John B. Kercheval of Hampshire, Junior Moral Course and Metaphysics.

Ro. McCandlish of Williamsburg, Junior Moral Course, Chemistry, National Law and Engineering.

D. E. Meade of Dinwiddie, 1st half Junior Moral Course, Chemistry, Mathematics and Engineering.

G. C. Medley of Halifax, Junior Moral Course, National Law, Political Economy and Metaphysics.

John Minge of Charles City, Junior Moral Course, Junior Mathematics, Chemistry, National Law and Engineering.

John E. Moore of Brunswick, History.

Edmund C Murdaugh of Williamsburg, History, Chemistry and National Law.

George U. Nottingham of Northampton, Junior Moral Course, Chemistry, National Law and Mathematics.

A. L. Pegram of Dinwiddie, Junior Moral Course, Chemistry and National Law.

W. R. Pierce of Williamsburg, Junior Moral Course, Junior Mathematics, Natural Philosophy and National Law.

David W. Pitts of Alabama, History.

William G. Pollard of King William, Junior Moral Course, Chemistry and National Law.

Winston Radford of Lynchburg, Chemistry, Natural Philosophy and Engineering.

James H. Rawlings of Spottsylvania, Junior Moral Course, Chemistry, National Law and Mathematics.

John W. Reins of Richmond, Engineering.

G. W. Richardson of Richmond, Junior Moral Course, National Law, Political Economy and Metaphysics.

Powhatan Robertson of Richmond, Junior Moral Course, National Law and Mathematics.

William Robinson of King & Queen, Natural Philosophy.

Wm. H. Scott of Georgia, Junior Moral Course and Metaphysics.

W. B. Seawell of Gloucester, Junior Moral Course, Chemistry, National Law and Metaphysics.

Churchill Semple of Williamsburg, Junior Moral Course, Junior Mathematics, Chemistry and National Law.

William H. Sims of Halifax, Junior Moral Course, Chemistry, Natural Philosophy and Metaphysics.

T. L. Skinner of North Carolina, Junior Moral Course, Junior Mathematics, National Law and Engineering.

Jabez S. Smith of Petersburg, Junior Moral Course, Junior Mathematics.

Orlando M. Smith of Lunenburg, Junior Moral Course, Chemestry and National Law.

Sydney Smith of York, Junior Mathematics and Chemistry.

John B Stanard of Fredericksburg, Junior Moral Course, Junior Mathematics, Chemistry and Engineering.

William B. Taylor of Surry, Natural Philosophy and Mathematics.

James B. Turner of North Carolina, History.

Th. S. Watson of Louisia, 1st half Junior Moral Course, National Law, Mathematics, Political Economy and Metaphysics.

William C. Williams of Richmond, Junior Moral Course, Junior Mathematics, Chemistry and National Law.

L. Y. Winder of York, History.

William P. Wood of North Carolina, Junior Moral Course. Junior Mathematics, Chemistry and National Law.

John J. Wright of Essex, 1st half Junior Moral Course and Metaphysics.

TO STOP A LEAKY CASK.

From the Farmers' Cabinet.

The best thing for stopping a leak in a cask is whiting, beaten up with common yellow soap; if this mixture be well rubbed into the leak, it will be found to stop it after every thing else has failed.

For the Farmers' Register.

ESSAY ON VEGETABLE PHYSIOLOGY.

By George D. Armstrong, Prof. of Nat. Philosophy and Chemistry, in Washington College, Va.

[Continued from page 334.]

Chapter XV.

MEANS WHICH PLANTS POSSESS OF PERFORMING THEIR VITAL FUNCTIONS. 1st. CAPILLARY ATTRACTION; 2nd. ENDOSMOSIS; 3rd. IMMEDIATE VITAL ACTION.

Having given, in the preceding parts of this essay, some account of the general structure of plants, and of the nature of those elementary organs by means of which they are enabled to perform their vital functions, to absorb nourishment from the earth and from the atmosphere, and appropriate it to the production, increase and repair of their different parts, we will now attempt to determine the means by which these organs are enabled to perform their vital functions. Plants may be considered as a set of machines, by which the common elements of nature are worked up into such a form as to be fit for the sustenance of animal life. We have already examined the structure of this machine; we will now direct our attention to the way in which it operates. "In this department of the science, the difficulties which the philosopher has to overcome are of a very different character from those which may have embarrassed him in merely determining the organization of a plant. In the latter case, good microscopes, manual dexterity in preparing the parts for examination, and sufficient patience for his task, are sure to bring the observer to conclusions, the general truth of which is often susceptible of exact demonstration; but when we come to consider the causes of vital phenomena, and the manner in which they are brought about, we have obstacles of quite another kind to overcome. There is not a function of vegetable life which is not preformed as it were behind a screen; the parts which are the prime movers in every operation, are so minute as to escape our view, until they have been killed for microscopic examination—fixed to the soil, destitute of passions and sensations, the visible expressions of which might lead us to the discovery of their invisible causes—having the whole of its organic mechanism concealed beneath a skin inert and opaque—we are compelled to trust for all our notions of the manner in which a plant performs its vital functions, to inductions from data about which, in many cases, there must always, from the nature of things, be some kind of uncertainty. In such circumstances, can we wonder that great diversity of opinion has existed among physiologists respecting many of the phenomena of vegetable life; or that multitudes of erroneous theories have obtained belief almost without question."

It would be inconsistent with the character of the present essay, to notice the different theories which have been successively advanced and abandoned; such an account would properly form a part of the history of vegetable physiology, and not of science itself; and whatever interest it might possess, or whatever instruction it might afford, it could assist as but little in our present inquiry. For this reason I shall confine myself to an explanation of the several means by which the organs of plants are now believed to perform their vital functions, and afterwards, to determine, so far as the circumstances of the case permit, the extent to which these means are severally employed.

The phenomena of vegetable life are, at the present day, generally ascribed, in part to capillary attraction, in part to *endosmosis*, and in part to motions in the organs of plants, caused immediately by the vital principle. We will examine these in the order in which they have been mentioned.

1st. *Capillary attraction.* This is that species of attraction manifested by the rising of liquids in small tubes, or between parallel plates placed at very small distances from each other. The most important of those laws which govern this species of attraction, are, 1st. it is only in tubes of less than one-tenth of an inch in diameter, that this attraction is manifested to any considerable degree; and it is in those tubes which are not larger than a hair, that it is most conspicuously manifested; 2nd, the height to which water will rise in capillary tubes of different diameters, varies inversely as those diameters; 3rd, that a tube $\frac{1}{100}$ of an inch in diameter will raise water 5. 3 inches. And since the height varies inversely as the diameter, the product of the diameter into the height is a constant quantity, viz. the .053 of an inch. From these data it is easy to determine the height to which a tube of any given diameter, will raise water; or knowing the height to which water is raised by any tube, to determine the diameter of that tube. These are laws which have been deduced from the results of experiments carefully made and frequently repeated, and we must take them as our guides in attempting to determine the part which capillary attraction acts, in the economy of vegetable life.

The rise of the sap of plants has long been ascribed principally to capillary attraction; and its descent to the attraction of gravitation. There are several very weighty objections to this way of accounting for the circulation of the sap. The first and greatest objection is, that capillary attraction is entirely inadequate to produce the effect ascribed to it. From a consideration of the third general law of this attraction, as given above, it will at once be seen that the diameter of a tube being known, the height to which water will rise in it can be ascertained by dividing .053 by that diameter expressed in decimals of an inch. The most common diameter of the ducts of plants, the only vessels which are continuous tubes, is about .002 of an inch. Dividing .053 by this, the result is 26.5 inches. The smallest of these vessels is about .001 of an inch in diameter. Such tubes would of course raise water 53 inches, or to just double the height of the former. But the sap of plants, instead of being raised only 26 or at most 53 inches, is, in the case of some of the large trees of tropical countries, raised to a height of 5000 inches. Another objection, and an unanswerable one, to this as a general theory, is that a whole natural family of plants, those termed cellular plants, are entirely destitute of tubular vessels; and yet their circulation goes on with as great, and in many instances, even greater rapidity than that of other plants. There is no plant which grows more rapidly than some species of fungus, and yet these are cellular plants, without one single tube in their whole structure. In these instances, capillary attraction is manifestly out of the question. Another objection is, that after the death of a plant, although the tubular vessels are all perfect, as is manifested by the rise of water in a piece of dry wood which has one end placed in a cup of water, the circulation of the sap entirely ceases. For these reasons we must give up the idea that capillary attraction is the cause of the rise of the sap, or if we admit that it has any part in producing this effect, that part must be a very inconsiderable one.

There are objections equally insuperable to the second part of this theory, viz. that the sap returns by gravity. One of these objections is, that in returning towards the root, the sap has very frequently to move upwards, in direct opposition to gravity, and not downwards, in conformity with that force. This is manifestly the case in twigs which put out from the lower side of limbs, and, for at least a part of their course, grow downward. On almost every tree, a greater or less number of such twigs may be found. The twigs of the weeping willow, those parts of the tree which are growing most rapidly, and in which the sap is circulating most abundantly, always bend downward. Another objection is, that we can assign no reason why, when two tubular vessels precisely similar in their structure, and placed in similar circumstances, the sap should ascend in one by capillary attraction, and descend by gravity in the other; and if we attempt to account for any phenomenon upon mechanical principles, we must assume nothing for which we can not assign a reason. Besides, the fact that a whole class of plants are entirely destitute of continuous tubular vessels, is as fatal to the idea that the sap descends by gravity, as that it ascends by capillary attraction. I should not have thought it worth the while to have been thus particular in stating the objections to this theory, had I not known that it has been for a long time the commonly received theory, and one with which most who have ever spent much thought on the subject have become acquainted with in some form or another.

2nd. *Endosmosis.* Perhaps the simplest definition which can be given of this term is, that endosmosis is that infiltration of one fluid into another, which takes place through bodies possessed of no visible pores. Thin animal and vegetable membranes, which in ordinary circumstances are impermeable to fluids, when made to separate fluids of different densities, are traversed by those fluids with greater or less rapidity. An example or two will make the matter plainer. "Take a common half-ounce vial, the bottom of which has been ground off, and tie a piece of bladder tightly over the opening thus effected. Fill it with a solution of gum arabic in water, and place it so that its lower end is beneath the surface of some water in a glass. The denser fluid will slowly attract the water through the membrane, and the contents of the vial will run over. Reverse the experiment by filling such a vial with water, and plunge the lower end into a solution of gum, and the water will pass out of the vial, through the bladder, as will be manifested by the sinking of the water in the vial, and the rising of that in the glass." In both instances, the rarer will pass into the denser fluid by endosmosis. Again, if we blow a soap bubble with atmospheric air, and then place it in a jar of ammoniacal gas, the bubble will be seen at once to enlarge, and display a beautiful play of colors upon its surface; and on examining the gas which it contains, we will find it a mixture of atmospheric air and ammonia. In this instance the ammonia must have passed through the sides of the soap bubble, although the film which formed the bubble is in ordinary circumstances impervious to gases. It passed by the process termed endosmosis.

Many experiments have been performed to prove that the cellular tissue of plants is capable of acting by endosmosis. Of these the following one of Dutrochet may be taken as an example. One of the valves of the capsule of the balsam was placed in water; the effect was, that it curved rapidly inwards and soon rolled itself up; it was afterwards placed in thick gum water, and it then curved outwardly, in a direction just the opposite of that which it had at first taken. In order to understand this, we must bear in mind the fact that the outside of a valve of the balsam is composed of larger and thinner cellules than the inside, and of course endosmosis would go on more rapidly through the sides of the outer cellules, than through those of the inner. When the valve was placed in water, the sap which the cellules of that valve contained, being the denser liquid, the water passed into the cellules; and in consequence of the nature of the cellules, it passed more rapidly on the outside than on the inside of the valve. The necessary effect of this was, to distend the cellules on the outside more rapidly than those on the inside, and thus to curve the valve inwards. When the valve was placed in a thick solution of gum, the solution was the denser fluid, and the effect of endosmosis was to draw the sap out from the cellules of the plant. This effect from the nature of the cellules would take place more rapidly on the outside than on the inside of the valve. In this case the inner cellules would soon be the most distended, and the valve would of course curve outwards. This experiment was frequently repeated and always with similar results. By such experiments, the fact is established beyond a doubt, that the vegetable tissues when filled with sap are capable of endosmometric action.

In order to get a clear idea of the part which endosmosis is supposed to act in the circulation of the sap, let us suppose that there is a line o cellules, stretching from the root to the leaf of a plant, each cellule in contact with the ones immediately above and below it, and all filled with a fluid of uniform density. The uppermost cellule of the series being in contact with the atmosphere, and exposed to the action of the sun and of the air, the sap which it contains will part with a portion of its water by evaporation, and will thus be rendered more dense than that of the one below it. In accordance with the principle already stated, endosmosis immediately commences, tending to render the sap contained in the two cellules of equal density, in part by the passage of the denser fluid downwards, and in part by the passage of the rarer fluid upwards. In this way the fluid which the second cellule of the series contains will be rendered more dense than that of the one immediately below it, and endosmosis commences between these too, tending to render their fluids of equal density; and so on to the end of the series. At the same time that endosmometric action commences at the upper end of the series, a similar action will commence at the lower end. The lower cellule filled with dense sap and placed in contact with the water contained in the soil, will at once commence attracting that water to itself, and in this way its sap being rendered rarer than that of the cellule above it, will be transferred in part to that cellule, and so on to the end of the series. Both of these operations, tending as they do to move the sap in the same direction, will conspire to produce the same result, viz, the raising of the sap from the root to the leaves. Again; let us suppose that there is a series of cellules extending from the surface to the heart of a tree, each cellule being supposed, as in the other case, to be in contact with those next it in the series, and all filled with a liquid of uniform density. By evaporation the liquid in the outer cellule of the series is rendered more dense than that of the one next it; it immediately commences an endosmosis upon that cellule, abstracting from it a part of its rare fluid and imparting in return a part of its own dense fluid; this second one operates in the same way upon the third, and so on. Such is in fact the condition of the cellules of a plant, and such is one of the ways in which their sap is believed to circulate. It will be perceived that endosmosis accounts for the motion of the sap in every direction, upward, downwards, and laterally; and moreover for two opposite motions, through the same set of vessels, and at the same time. It also accounts for a circulation in cellular plants, and the cellular parts of other plants, such as the pith and medullary rays. In all these respects it agrees with the results of direct observations. Without attempting to determine the extent to which the circulation of the sap is properly attributable to endosmosis, we will dismiss this subject for the present, as we shall have occasion to recur to it again.

3rd *Vital action*. Besides the effects which can be fairly ascribed to endosmosis, there are others which we must attribute to motions in the organs of plants caused immediately by the vital principle. It is certain that movements do take place in the organs of plants, which appear to be in no way connected with endosmosis. An instance will be afforded by cutting in two a stalk of lettuce. The milky juice contained in the cellules of the bark will be found to exude from the extremities of both portions of the stem. This cannot be caused by a power exerted from below, for then the sap would exude from the lower portion only; neither can it be caused by the gravity of the sap, for then it would exude only when the part had its extremity turned downwards, whereas in fact, it flows out with equal rapidity, in whatever position the stalk may be placed. This effect can spring from no other cause then from a contraction in the sides of the cellules. Another and a still more striking instance, is afforded by the cellules of the leaf of the lettuce during the flowering season. Let a leaf be touched ever so slightly, so as not to break the cuticle, the milky juice will nevertheless exude and form a large drop.

The force with which the sap is propelled through the stem of a growing plant is much greater than we are generally in the habit of considering it. This matter has been the subject of some curious and instructive experiments, of which the following, from Hales' 'Vegetable Statics,' may be taken as an example. "April the 6th, at 9 A. M., rain the evening before, I cut off a vine on a southern aspect, at 2 feet 9 inches from the ground; the remaining stem had no lateral branches, it was ⅞ inch in diameter; I fixed on it a mercurial gauge. At 11 A. M. the mercury was risen 15 inches higher in the open leg, than in the *one attached* to the end of the vine, being pushed up *by the* force of the sap which came out of the stem. At 4 P. M. it was sunk on inch. April 7th, at 8 A. M. was risen very little, a fog; at 11 A. M. 'tis 17 inches high, and the fog gone. April 10th. at A. M. mercury 18 inches high; I then added *more* mercury so as to raise the surface to a height *of* 23 inches; the sap retreated very little into the stem, upon this additional weight, which shows with what an absolute force it advances; at noon it was sunk one inch. April 11th. at 7 A. M. 24½ inches high, sunshine; at 7 P. M. 18 *inches high.* April 14th. at 7 A. M. 20½ inches high; at 9 A. M. 22½, fire warm sunshine; here we see that the warm morning sun gives a fresh vigor to the sap. At 11 A. M. the same day 16½, the great prespiration of the stem makes it sink. April 16th. at 6 A. M., 19½ inches, rain; at 4 P. M. 13 inches. April 17th, at 11 A. M. 24¼ inches high, rainy and warm; at 7 P. M. 29½ warm rainy weather, which made the sap rise all day, there being little perspiration by reason of the rain. April 18th. at 7 A. M. 32½ inches high, and would have risen higher had there been more mercury in the gauge; from this time to May 5th the force gradually decreased. The greatest height of the mercury being 32½ inches; the force of the sap was then equal to 36 feet 5⅓ inches height of water. In another like mercurial gauge (fixed near *the bottom* of a vine which ran 20 feet high), the mercury was raised by the force of the sap 38 inches, equal to 43 ft 3⅓ in, height of water; which force is about five times as great as that of the blood in the great crural artery of a horse, seven times as great as the force of the blood in the like *artery* of a dog; and eight times as great as in the same artery of a fallow doe." In the results of the above experiment there can be no error; the measurement of a propelling force by means of a mercurial gauge is one of the most accurate and most unexceptionable methods of measurement which we possess. The force with which the sap was driven upwards, in the last mentioned instance was equal to more than 20 lbs. to the square inch. To recur to the orginal question; what cause can we assign for so powerful a propulsion of the sap as is here indicated? Endosmosis will account for it in part; but it appears to me that we must admit an alternate contraction and dilatation of the cellules themselves as one principal cause.

Perhaps some may object to this explanation on the ground of the stiffness of the vegetable textures; but let it be recollected that this stiffness exists, not in the cellular and vascular tissues, the tissues through which the circulation takes place, but in the woody fibre, which is disposed throughout the plant for the purpose of giving strength and consistency to the vegetable structure. The membrane of which the celluler and vascular tissues are composed, is soft, yielding, and in every way fitted for such alternate contractions and dilatations as are supposed.

Should it be objected, that although the texture of these vessels is such as to fit them for such a work, yet we can conceive of no way in which the vital principle, be that principle what it may, can operate so as to produce this effect. In answer, I would say, neither can we conceive of the way in which the vital principle operates to produce similar dilatations in the heart of man; and yet we know from actual observation that such effects are produced. These notions take place as long as the man remains alive; the moment he dies, they cease at once; hence we ascribe them to the immediate agency of the vital principle; and although the way in which what we have termed the vital principle produces this effect is an inexplicable mystery, and in all probability will ever remain such, yet we never think of calling the fact that such motions do take place, in question, on that account.

But it may be further objected, that these motions in animals appear to be inseparably connected with a nervous system; and that no such system exists in vegetables. This remark is not strictly true. "The nervous system, which is very distinct from all others in animals of the higher classes, gradually tends to divide; and finally, one is forced to admit, that in zoophytes the nervous matter is diffused, as it were, throughout the whole body, so that they possess a kind of universal sensibility, without there being any where a nervous system distinct from the tissues." If such is ascertained to be the fact with respect to zoophytes, why may we not go a step further; and suppose that in vegetables the nervous matter is uniformly diffused, or, what amounts to the same thing, and will perhaps appear less objectionable, that the tissues are constructed in such a way as to be capable of performing so many of the functions of a nervous system, as are necessary in the economy of vegetable life. There is no essential difference in the composition of the most perfect nervous system, and the other parts of the animal body, which would forbid such a supposition. They are all composed of the same elements, and differ only in the manner in which those elements are organized. The fact, that when certain poisons are made to enter vegetable systems, or when plants are killed by electricity, the tissues at once stiffen and become entirely incapable of circulating the sap, favors this idea. But whatever explanation we may give of the matter, the facts of the case seem to require, that we admit the existence of alternate dilatations and contractions in the tissues of plants, produced immediately by the vital principle.

CHAPTER XVI.

FOOD OF PLANTS. WATER. CARBONIC ACID GAS. NITROGEN. OTHER SUBSTANCES FOUND IN PLANTS.

In speaking of the composition of vegetable substances, chemists distinguish between their proximate and ultimate principles. The ultimate principles of vegetables, are the simple elementary substances of which they are composed, such as carbon, oxygen, &c. The proximate principles, are those compounds into which these elements are united by the action of vegetable systems, such as, gum, resin, sugar, &c. The ultimate elements of which all vegetable substances are composed, are but few. Carbon, oxygen and hydrogen, are the only ones which exist in any considerable quantity, and where others enter, they seem to enter rather as accidental, than as essential ingredients. The proximate principles are very numerous, and every year, the researches of the chemist are adding to their number; yet as they are all made up of pretty much the same ultimate elements, they must of course, resemble each other closely in comparison. In order that a plant may increase in size, it must be supplied with carbon, oxygen and hydrogen, which may be considered the raw materials of the vegetable fabric, and of course the food of plants must contain these elements, either in a separate state, or in such compounds as the organs of the plant shall be able to decompose.

It was at one time believed that pure water was capable of sustaining and nourishing plants, and that in fact it was their only proper food. This opinion was founded in part upon such experiments as the following of Von Helmont. Having placed a young willow in a box containing a known quantity of pure sand, and supplied it plentifully with water, it was found to increase in size very rapidly. After being suffered to grow for a time, it was removed, and the sand carefully weighed; when it was found to have undergone no perceptible variation in weight. Hence, it was inferred that the plant was nourished by the water alone. It was afterwards suggested to this experimenter, that in as much as he used common spring water, that water might contain other substances in solution. He repeated the experiment, using distilled in the place of common water, and the plant died. But without the decisive result of the last experiment, we might be satisfied that the opinion was erroneous, from our knowledge of the composition of water. Water consists of oxygen, and hydrogen, and nothing else. Now, if pure water is the only proper food for plants, whence is it that they are to obtain their carbon, an element which enters largely into the composition of every part of the vegetable structure.

The fact seems to be, that what may properly be called the food of plants, because it is that without which they cannot exist, is atmospheric air, together with water, containing carbonic acid gas in solution; and these alone are sufficient for their support. Water has the power of absorbing and retaining a large portion of many of the gases; of carbonic acid gas, recently boiled water will absorb its own volume. Placed as water in ordinary cicumstances is, in contact with the atmosphere, which always contains a greater or less portion of carbonic acid gas diffused throughout it, it will always, when subjected to examination, be found to contain a portion of this gas in solution. It is probably in this way that the greater part of the carbon which exists in vegetables, is introduced. This carbonic acid is derived from many sources; but principally from the decomposition of the various organic substances which lie buried in the soil, or scattered upon its surface. All vegetables, when they rot, or undergo decomposition, are resolved principally into water, carburetted-hydrogen and carbonic acid; and it is to their ability to supply this last mentioned substance, that putrescent manures owe their nutritive properties. If we look at the effects of such manures, we will find that their energy is proportioned to their capability of forming this acid. "Yeast, for instance, which is one of the most active of these manures, is so from possessing, beyond all other substances, the power of exciting fermentation, and thus of causing the formation of carbonic acid from the vegetable matter which lies buried in the soil."

It is only in the state of carbonic acid that carbon can enter into the system of a plant. If a plant is placed in solid carbon, and watered with distilled water, it might as well be planted in powdered glass, so far as its growth is concerned. Sir H. Davy placed a plant of mint in water mixed with carbon in a state of impalpable powder, and he found that not a particle could enter the roots. When carbonic acid enters the system of a plant, it suffers decomposition, its oxygen being liberated and its carbon fixed in the tissues. This has been proved by many very satisfactory experiments. If fresh gathered leaves be placed in water, and thus situated, be exposed to direct sunlight, they will soon be covered with minute air bubbles, which if collected and examined, will be found to be pure oxygen. The earliest observers of this circumstance supposed these bubbles to be liberated from the water by the heat of the sun; for when leaves were placed in water which had been deprived of the air which it contained by boiling, no bubbles appeared. The correct explanation of this fact is, that in such circumstances, there is no carbonic acid furnished by the water for the plant to decompose.

De Candolle has proved that the oxygen we collect in such cases, arises from the decomposition of carbonic acid in the following manner. He placed in a pneumatic cistern filled with distilled water, two inverted glass jars; one of which was filled with the water of the cistern, and had floating in it a plant of mint; the other contained carbonic acid gas. To prevent all absorption of carbonic acid from the atmosphere, the surface of the water in the cistern was covered with a thick layer of oil. The whole apparatus thus arranged was exposed to direct sun-light. The carbonic acid soon began to disappear, but just as fast as it disappeared from one vessel oxygen appeared in the other. In order to understand this experiment it is necessary to bear in mind the fact, that the elements of carbonic acid are condensed into one-half their original volume when they combine with each other. If 100 cubic inches of oxygen unite with 100 cubic inches of the vapor of carbon, they will not form 200 cubic inches of the resulting compound, but each being condensed into one-half its original volume, they will form but 100 cubic inches. Just the reverse of this takes place when carbonic acid is decomposed; every 100 cubic inches of carbonic acid will furnish 100 cubic inches of oxygen, and 100 cubic inches of the vapor of carbon. This explains the fact that oxygen appeared in one bell glass just as fast as carbonic acid disappeared from the other. He afterwards varied the experiment by substituting oxygen for the carbonic acid in the second glass. In this case no gas was given off by the plant, neither did any of the oxygen disappear; thus proviug that plants have a specific power of absorbing carbonic acid, and after decomposing it, of retaining the carbon and rejecting the oxygen; and that the oxygen given off by growing plants is derived from the decomposition of carbonic acid.

Two conditions appear to be necessary for the successful repetition of this experiment. 1st. That the plant should be green and living, since it has been found that recently killed, but still green plants, emit no gas. 2nd. Exposure to direct sunlight, for neither the clear light of day, nor that of the brightest lamp produce any effect. From some experiments recently performed, it would seem that this effect is due entirely to the chemical part of the ray of light. It has long been known that a ray of solar light was composed of three distinct and separable rays, viz, a luminous ray; a heating, or as it is more commonly called, a calorific ray, which is not luminous; and a chemical ray which is neither heating nor luminous. By a certain contrivance, it is easy to absorb any two of these rays, whilst the third is suffered to pass on undisturbed. By subjecting a plant to each of the three rays in succession, it has been found that it is the chemical ray alone which is capable of producing any effect. These facts should be borne in mind by any one who may wish to repeat the experiments of De Candolle.

Although all experiments combine to prove that carbonic acid is the most essential of the elements on which plants are nourished; yet water is also a necessary part of their food. It is true that a large portion of the water taken up by a plant is lost again by evaporation, yet accurate experiments show that a portion of it actually enters into the composition of the plant. Saussure found that when plants were grown in close vessels, in an atmosphere containing a little carbonic acid, the weight which the plant acquired in a given time, was much greater than that of the carbon produced by the decomposition of carbonic acid, and this could be accounted for in no other way than by supposing it to have fixed a considerable quantity of water; thus plants of the *vinca*, which in a vessel without carbonic acid had gained 1¾ grains from water only; acquired 5 $\frac{8}{10}$ grains *when they* were at the same time able to procure carbonic acid. That water is an essential part of the food of plants, may be learned from the fact, that almost all the proximate principles contain hydrogen, an element which does not exist in carbonic acid, and of course cannot be furnished by it. The water which enters into the composition of a plant, probably enters without undergoing decomposition. On this subject Prof. Lindley remarks, "as it has been pretty well made out that all the oxygen given off by plants, is produced by the decomposition of carbonic acid, and as no one has ever been able to detect the emission of hydrogen by any plant except mushrooms, it is inferred that if the water which is consumed by plants is ever decomposed, it is in the formation of the various proximate principles which contain more oxygen (viz. acids,) or more hydrogen (viz. oils,) than water; but as the greater part of vegetable substances, such as gum, sugar, fecula, &c., contain oxygen and hydrogen in the same proportion as water, it can hardly be doubted that the water undergoes no decomposition, but is simply fixed."

"It was formerly thought that nitrogen or azote had nothing to do with the nourishment of plants; and that, in those cases where it was met with, it was merely in a state of separation from the atmospheric air which had been inhaled and deprived of its oxygen and carbonic acid. But its constant occurrence in combination with the tissue of mushrooms, and cruciform plants, in gluten, and in what chemists call vegetable albumen, and also in the vegetable alkalies, seems a sufficiently strong proof of its contributing in some way or other, to the nutrition of the vegetable system." In what condition the nitrogen enters the system of a plant, is a question which has never as yet been satisfactorily settled. The most probable answer is, that it is absorbed by the leaves, from the atmosphere. At any rate, this much is certain, that leaves do absorb much gaseous matter from the atmosphere, and that nitrogen exists in very large quantities in the atmosphere; according the best analyses $\frac{73}{100}$ of our atmosphere are nitrogen. It is probable that a portion also enters in solution in water, like carbonic acid. It is true, that nitrogen is by no means as soluble in water as carbonic acid, water dissolving only about $\frac{2}{100}$ of its bulk of nitrogen; but yet when we call to mind the vast quantity of water which passes through the system of a plant during its growth, and remember at the same time the small extent to which nitrogen enters into the composition of vegetables, we will see that no inconsiderable portion of it may have entered in this way. It is possible also, that a portion of nitrogen may enter, in combination with other substances, and be afterwards separated from its combinations, and fixed by the vital action of the tissues of the plant; in just the same way in which carbon is separated from its combination with oxygen in carbonic acid. There are several compounds which experience has proven to be very valuable as manures, which contain nitrogen. Ammonia is one of these; its composition is, by weight, 3 parts of hydrogen to 14.15 of nitrogen. The salts of ammonia exist in large quantities in common soot, and this is known to be a very active manure. It is true that soot is generally classed among stimulating manures, but may it not be that it stimulates the growth of a plant, simply by furnishing one of its necessary articles of food? What renders this opinion the more probable is, that soot is found to be a manure particularly efficacious in the case of cruciform plants, (*i. e.* plants whose flowers consist of four petals arranged in the form of a cross, such as the cabbage, turnip, &c.,) and these are the plants which contain the greatest quantity of nitrogen.

Besides carbonic acid, water, and nitrogen, which form what may with propriety be called the food of plants, there are several earthy and metallic substances, which are taken up from the soil in considerable quantities, by certain plants, and afterwards deposited in their tissues. About the part which these substances act in the economy of vegetable life, we know but little. "One of the most remarkable of these is silex, which is secreted by certain plants in very great quantities. All grasses abound in it; usually it fixes itself in the cuticle; but in the bamboo it is also deposited in considerable quantities in the hollow joints, under the form of the substance called tabasheer. The skin of the rattan palm, abounds so much in silex that it will strike fire with steel; the same substance exists in teak and other kinds of wood, to which it gives a peculiarly gritty texture; and in the scouring rush, (*equisetum*,) one species of which is used for polishing wood, in consequence of its whole surface being composed of compact silicious particles. It was once thought that silex must be actually formed by the action of the vital principle of vegetation; but further investigations into the nature of silex, have shown that in certain circumstances, silex is soluble in water, and it is more probable that it is in this way that it enters plants. Considering the immense quantity of water that passes through a plant in the course of its growth, there is no difficulty in conceiving the possibility of the largest quantity of silex, which is ever met with in plants, being introduced in this way." But even if we could not account for the introduction of silex into plants, we could by no means admit that it was formed by the vital action of plants themselves; inasmuch as with such an admission, we must also admit that plants possessed, either a creative power, or else a power of transmuting one of the simple elements into another; an admission which contradicts the best established laws of chemistry.

Lime, magnesia, potassa, soda, sulphur, phosphorus, and several of the metals, occur in many plants in greater or less abundance; all evidently taken up from the soil. "Of these soda is the best known and most abundant, existing to the amount of as much as 55 per cent., in the form of a carbonate in the ashes of a species of sea-weed (*salsola sativa;*) and copper, the least suspected and most curious. This metal is stated by De Candolle to form eight parts in a million in coffee, and about four and a half parts in a million in wheat; whence he has calculated that there is annually imported into Europe more than 1200 lbs. weight of copper in coffee, and that the French annually consume nearly 8000 lbs. in their bread.

Our knowledge of the nature of the food of plants, will enable us to explain some facts which have been established by experiment, for instance, the manner in which clover improves land, and may perhaps suggest other rules to the practical agriculturist. Had we no experience on the subject, it would seem, to say the least, improbable that any crop could improve land. We would naturally suppose that plants were nourished by the ground itself,—that they fed upon the soil. If such be the case, when a crop is ploughed under and decays, it can give nothing but what it has first taken; and how then can it improve land? Yet we find that growing clover upon land, and then ploughing it under and suffering it to decay, is one of the very best methods of improving land. Bearing in mind the nature of the food of plants, this admits of a very simple explanation. We will suppose that clover is sown upon a perfectly barren spot. The atmosphere which is above this spot contains a portion of carbonic acid gas, for all atmospheric air contains a greater or less portion of it. A rain comes; as it falls, it absorbs a portion of this gas, and in this condition enters the ground. No sooner does it come in contact with the seed in the first instance, and with the root afterwards, then it is absorbed and its materials used for increasing the size of the vegetable structure. When the portion of air above the spot, has in this way been exhausted of carbonic acid, a supply is obtained from the neighbouring portions in consequence of that strong tendency which gasses possess, to intermix and diffuse themselves throughout each other. This process is repeated again and again, and thus the clover increases in size. But whence is this gas obtained? From many sources; from the breath of animals, for whilst animals inhale oxygen they exhale carbonic acid from the burning of most combustible bodies, but principally from decaying vegetables such as are found in the woods and along the fence sides. The quantity of the several elements which enter into the composition of our globe is fixed; it is impossible for man either to increase or diminish this quantity; and it is also impossible for him to convert one of these elements into another. All he can do is to make an economical use of that which already exists, to gather up those portions which subserve no valuable end and apply them to use. This is what the farmer does in sowing his land with clover. He impresses the very wind into his service, for every wind which sweeps over a field of clover, laden as that wind is with the materials of which vegetables are formed, is made to contribute to its growth. After a large portion of vegetable matter has in this way been collected upon the once barren spot, it is ploughed under, and secured for future use.

It is a fact well ascertained, that animals, whilst they inhale a large portion of oxygen, exhale a large portion of carbonic acid. From the long continuation of this process we would suppose that the composition of our atmosphere would in the course of time suffer a material change; that it would become so surcharged with carbonic acid as to be unfit for the support of animal life. And yet so far as we can ascertain, the composition of our atmosphere is very much the same now that it was a thousand years ago. In what way is this uniformity of composition preserved? If we call to mind the nature of the food of plants, the matter admits of a very simple explanation. Plants take in carbonic acid, and retaining the carbon fixed in their tissues, return the oxygen to the atmosphere; a process just the reverse of that performed by animals. In this, we see one of those beautiful compensating arrangements with which creation abounds.

CHAPTER XVII.

ELABORATION OF THE SAP. NATURE OF PROXIMATE PRINCIPLES. INFLUENCE OF LIGHT. INFLUENCE OF HEAT.

By the elaboration of the sap, is meant, its conversion, from crude sap, into the several proximate principles of which vegetables consist, such as sugar, gum, resin, tannin, &c. In order to understand this subject, and also, how it is that such substances as compose the food of plants, are capable of being connected into the various proximate principles which the vegetable kingdom presents, it will be necessary, in the first place, to attend to a few general facts respecting the composition of these proximate principles. Among the most important of these facts are—

1st. That they are all composed of pretty much the same elements, and frequently contain those elements in the same proportions.

2nd. That they are all decomposed with facility, and frequently are mutually convertible into each other.

3rd. That in general they cannot be formed by art.

We will examine each of there general statements, somewhat in detail.

1st. The proximate principles of vegetables are all composed of pretty much the same elements; and frequently contain these elements in the same proportions. This will be evident from an inspection of the following table, prepared from a statement of their compositions as given in *Turner's* Chemistry. The numbers opposite the names of the substances refer to their equivalents; if it is desired to find their composition in grains, the numbers for oxygen must be multiplied by 8, for carbon by 6.12, for nitrogen by 14.15, and for hydrogen by 1.

Vegetable Acids.	Carbon	Hydrogen	Oxygen	Nitrogen
Oxalic acid,	2	—	3	—
Acetic "	4	3	3	—
Citric "	4	2	4	—
Tartaric "	4	2	5	—
Gallic "	7	3	5	—
Malic "	4	2	4	—
Racemic "	4	2	5	—
Vegetable Alkalies.				
Morphia,	34	18	6	1
Cinchonia,	20	12	1	1
Quinia,	20	12	2	1
Aricinia,	20	12	3	1
Sugar,	6	6	6	—
Starch,	6	6	6	—
Alcohol,	4	6	2	—
Oil of cloves,	20	13	5	—
Camphor,	10	6	1	—

From an inspection of the composition of the substances mentioned in the above table, it will be seen that several of them consist, not only of the same elements, but contain those elements in the same proportions, or, in the language of chemistry, are isomeric. This is explained, by supposing that whilst the different substances contain the same elements, that yet those elements are differently united with each other. An example will make this plain. Suppose that we have one equivalent of sulphur, four of oxygen, and one of copper, to combine; these may readily be so united as to form two entirely distinct compounds; two equivalents of the oxygen may unite with the one of sulphur and form sulphurous acid; and the remaining two with the one of copper, forming binoxide of copper; these two binary compounds then uniting would form the sulphite of the binoxide of copper; or three equivalents of oxygen may unite with the one of sulphur, forming sulphuric acid, and the remaining one with the one of copper, forming protoxide of copper; these two binary compounds then uniting would form the sulphate of the protoxide of copper, a compound entirely different from the former. Or expressing it in chemical symbols, we might have

$$(S + 2\text{ ox.})\ (Cu + 2\text{ ox.}) = S + Cu + 4\text{ ox.}$$

$$\text{Or } (S + 3\text{ ox.})\ (Cu + \text{ox.}) = S + Cu + 4\text{ ox.}$$

It is in this way that the difference between the different isomeric substances with which we meet in the vegetable kingdom, is supposed to be produced.

2nd. The proximate principles of vegetables, all readily undergo decomposition, and are frequently convertible into each other. Most vegetable substances, when placed in a warm damp atmosphere, undergo a series of changes, which result in their entire dissolution. When thus decomposed, they are not, however, separated into their ultimate elements, viz., carbon, oxygen, hydrogen and nitrogen, but into certain simple binary compounds of these elements, among the most abundant of which are, carbonic acid ($c + 2$ ox.,) water ($h +$ ox.) light carburetted hydrogen ($c + 2\,h$,) and ammonia ($3\,h + n$). Those which are not thus decomposable, will all undergo decomposition at a temperature less than that of a white heat. They are also frequently convertible into each other; for instance, starch, which is isomeric with sugar, is readily convertible into that substance, and does in fact undergo such a change during the germination of the seed; this is no more than we should expect from our knowledge of their composition.

3rd. In general, vegetable substances cannot be formed by art. Although we are perfectly well acquainted with the composition of sugar, for instance; we know that it is composed of 6 equivalents of carbon, 6 of hydrogen, and 6 of oxygen, and we can easily procure such of these substances, and present them to each other in just the proper proportions to form sugar, yet in no way which has yet been discovered can we cause them so to unite as to form that compound. That this should be the case with those substances which possess a distinct organization, is not a matter of surprise, but that it should likewise be the case with those which possess no other than a crystalline structure, is probably to be attributed to the imperfection of our knowledge of vegetable chemistry. We cannot indulge a reasonable hope of ever being able, by any process of art, to form cotton from simple inorganic carbon and water, although we know it to be composed principally of those materials; but we may indulge a hope that, when our knowledge of chemistry is more complete, we may discover a way of forming sugar from carbon, oxygen and hydrogen, either by the direct union of these elements, or else of some of their binary compounds; at least, there is nothing absurd in the indulgence of such a hope. But whatever may be the fact in time to come, it is certain that we know of no process by which they can be formed at the present day; and this should be borne in mind in examining into the elaboration of the sap, as we must not expect to find that it is effected by any process which has an exact parallel in the arts.

We are now prepared to discuss the question, by what means are plants enabled to effect the elaboration of their sap. As that sap enters the root, it is a thin fluid consisting principally of water containing carbonic acid gas in solution; from this raw material, in some way or another, plants are enabled to form all the components of the vegetable structure, the wood, the starch, the sugar, the gum, the oil, the resin, the acids, &c. The question is, by what means is it that plants are enabled to effect these changes. To give a full and complete answer to this question, is impossible in the present state of our knowledge of vegetable physiology; yet there are some facts which have been ascertained by experiments carefully performed and often repeated, which it may be important to the practical agriculturist to know.

The most important of these is, that many of those chemical changes which constitute what is termed the elaboration of the sap, are effected through the agency of solar light, or if not by its direct agency, it is necessary to enable the plant to effect them. How it is that light is able to change the chemical relations of substances, so as to cause those to combine, which would otherwise have remained separate; or to cause those to separate which would otherwise have remained combined, is a matter of which no satisfactory explanation has ever as yet been given; and yet there is no fact in chemistry which is better established than that it does act in this way. If a bottle partly filled with nitric acid, be set away in a dark place, it will undergo no change; but if it be exposed to direct sun-light, a decomposition of a portion of the acid at once commences, and the whole of the upper part of the bottle will soon become filled with a mixture of oxygen and nitrous acid. If a mixture of equal volumes of chlorine and hydrogen be enclosed in a bottle, and light be carefully excluded, no combination will take place, it matters not how long they be thus kept mixed; but if the mixture be exposed to diffuse day-light, the two gases will gradually combine, and form hydrochloric or muriatic acid; if the mixture be exposed to direct sunlight, the combination takes place as instantaneously, and with as violent an explosion, as if caused by the contact of flame or by the electric spark. These facts, and numerous others of a similar character, which might be mentioned did it seem necessary, establish beyond question, the principle that light does possess the power of so altering the ordinary chemical relations of bodies as to cause combinations and decompositions which otherwise would not take place.

The principal agency of light appears to be exerted in effecting the decomposition of carbonic acid, and in fixing the carbon thus obtained, in the tissues of the plant. Some of the evidence on which this statement rests, has been given in a preceding chapter; I will here add only a few remarks of De Candolle, in which he has embodied the results of numerous experiments performed by himself. "If" says he "two plants are exposed, one to darkness, and the other to the sun, in close vessels and in an atmosphere containing a known quantity of carbonic acid, and are removed, at the end of twelve hours, we will find that the first has diminished neither the quantity of oxygen, nor of carbonic acid; and that in the second, on the contrary, the quantity of carbonic acid has diminished, while the quantity of free oxygen has increased in the same proportion. Or if we place two similar plants in close vessels in the sun, the one in a vessel containing no carbonic acid, and the other in air which contains a known quantity of it, we shall find that the air in the first vessel has undergone no change, while that in the second will indicate an increase of oxygen proportioned to the quantity of carbonic acid which has disappeared; and if the experiment is conducted with sufficient care, we shall discover that the plant in question has gained a proportionable quantity of carbon. Therefore we conclude that the carbonic acid which has disappeared, has given its oxygen to the air, and its carbon to the plant, and that this effect has been produced solely by the action of solar light." All the experiments which have hitherto been made, lead us to the same conclusion that solar light is absolutely necessary to plants, to enable them to digest the crude matter which they obtain from the soil.

"The fixing of carbon by the action of light contributes in an eminent degree to the quality of timber; a point of no small importance in all countries. It is in a great degree to the carbon incorporated with the tissue, either in its own proper form, or in combination with other elements, in the form of resinous or astringent matter, that difference in quality in the timber of the same species of tree is principally owing. Isolated oak trees, fully exposed to the influence of light, become a tougher and more durable timber, than the same species growing in dense forests; in the former case its tissue has been solidified by the greater quantity of carbon fixed in the system during its growth. There is every reason to believe that the brittle wainscot oak of the Black Forest, Eng. is produced by the very same species as the solid naval timber of Great Britain." The results of chemical analysis confirm this opinion, as will be seen by noticing the quantity of carbon obtained form different kinds of wood, as given in the following table.

Cormonna-wood	-	55 per cent of carbon.
Iron-wood	- -	53.44 "
Oak	- - -	52.50 "
Beech	- - -	51.45 "
Box	- - -	50 "
Willow	- -	49.80 "

"It is to the power which sun-light possesses of decomposing carbonic acid, and fixing the carbon in the tissues of the plant, that the direction which the branches of a tree assume, is generally to be ascribed. When a branch first protrudes from a stem, its own weight would bend it downwards, if it were not for the effects of light from above, which solidifies the part exposed to it. Let any one expose a green branch in such a way that light strikes it only on one side; the tissue on that side will fix the most carbon, will become harder and lengthen less; while the tissue of the opposite side, fixing less carbon, will harden less, and lengthen more; the consequence of which will be that the branch will be eventually turned towards the light. This will explain the uniform tendency of the green parts of plants to turn towards the light."

Besides fixing simple carbon in the tissues of a plant, light appears to exert a very important and necessary agency in the production of many of the proximate principles of vegetables. Of its influence in the production of the various kinds of coloring matter, and also, of the odoriferous principles, I have already spoken, when treating of those subjects. To the formation of starch, a substance into the composition of which carbon enters very largely, sun-light appears to be necessary. It is to the starch which they contain, that potatoes, corn, and many other plants, owe most of their nutritive properties. Potatoes grown in the dark, are always watery, in consequence of no starch being developed in them; and indeed the quantity of nutritive matter which they contain, is, in other circumstances, proportioned to the intensity of the light to which their leaves, (the organs in which the elaboration of the sap is principally effected,) are exposed. When orchard-ground is undercropped with potatoes, the quality of the potatoes is never good, simply because so large a quantity of light is intercepted by the leaves and branches of the orchard-trees, as to retard the formation of starch. The formation of the milky juices of many plants, appears to depend upon the presence of solar light. As these milky juices are frequently poisonous, it is a matter of great importance to prevent their formation, where the plant is intended to be eaten. Hence the common practice of blanching, as it is called; which is in fact nothing more than excluding the sun-light from the plant, to prevent the formation of certain substances which would have been formed, had sun-light had free access to the plant. Hence too, the safety with which the young shoots, which have but just protruded from beneath the ground, are eaten, when the same plant if eaten at any subsequent period of its growth, would have been highly deleterious.

Another of those facts which the practical agriculturist should bear in mind, is that temperature has great influence over the elaboration of sap. The agency which heat exerts in *this process*, is no doubt, to be attributed princi*pally to the* evaporation of watery fluids from the crude sap, which it necessarily causes. It has long been known that a very large portion of the water which is absorbed by a plant is afterwards lost again by evaporation. Indeed such it will at once appear, must be the case, if we call to mind the fact, that all the solid components of vegetables must enter them in solution of water, and that many of those solids are soluble to but a very small extent, in that fluid. It is possible, perhaps we might say probable, that heat also exerts a direct agency in causing combinations among the elementary substances, of which plants are composed. There is no known agency which is more powerful than that of heat, in effecting changes in the chemical relations of bodies; hence it is that the chemist, in almost every operation, depends upon its assistance. When we know that heat does exert so powerful and so universal an influence as this, in those chemical operations which are effected by the art of man, it would seem but a reasonable inference, that nature also would make use of it, in those more complicated, and as they seem to us, more mysterious operations, which art may in vain attempt to imitate.

But in whatever way heat may affect the vital action of plants, it is certainly true, and every one's observation will convince him of the fact, that it does exert a powerful influence over those vital actions. It is only when the temperature of the air is raised sufficiently high, that the vital energy of a plant is excited. Although light is necessary to perfect the growth of a plant, and to the formation of many of those proximate principles which plants contain, yet if a plant be exposed to an elevated temperature, though it be in total darkness, that developement of its parts and consequent increase in size which we denominate growth, will certainly take place. The influence of heat appears to be exerted immediately upon the stem and leaves, and through them, upon the root. Hence it is, that when one branch of a vine growing in the open air, is introduced into a hot-house, the temperature of the hot-house excites the buds into action; they immediately attract fluids from beneath them, and thus the whole system is put in motion, although the parts of the vine-plant beyond the house, are exposed to all the inclemency of winter. "De Candolle has proved by a simple experiment, that in such a case as this, the fluid consumed by the young leaves is really attracted from out of the cold earth, and not absorbed from the atmosphere of the hot-house. Having selected a young tree with two principal branches, and two principal roots corresponding to them, and adapted to each root a bottle of water, he found that the bottle attached to the root corresponding to the branch which had been introduced into the hot-house was quickly emptied, while that attached to the root corresponding to the branch in the open air remained nearly full. It may be supposed that in a natural state of things, some effect is produced upon the roots by the warmth of the soil; but it is doubtful whether this amounts to much if indeed it is of any importance; for provided only the earth is not frozen, it appears from experiments, that heat applied to the branches alone, is quite sufficient to determine and maintain all the phenomena of growth.

Besides the influence which light and heat may exert in effecting the elaboration of the sap, there is much which in the present state of our knowledge, we are obliged to ascribe to the immediate agency of the vital principle. What peculiarity there may be in the structure of one cellule which determines it to secrete resin, whilst another by its side secretes an acid—or whether it is any thing in the structure of the cellule which determines the result, are questions which we cannot solve. The most careful microscopic observations have discovered to us no difference in structure, and disclosed no peculiarities in operation. In such circumstances, all that we can say is, that they appear to be produced under the immediate agency of the vital principle; or perhaps we would come nearer to a simple statement of facts, and our statement would be less liable to objection, should we say, that they take place while the plant is alive, and cease the moment that it dies. It must be confessed that this is but a poor apology for an explanation; and yet it is, in fact, all that is known respecting the matter. There are many things in the structure and vital action of plants, which, with all our knowledge of nature, we cannot fully explain.

(To be continued.)

ADVANTAGES OF EMBANKING THE TIDE MARSHES OF MARYLAND.

For the Farmers' Register.

Improvement in the agriculture of this section of country is now gradually advancing; many marl banks have been opened, and worked, though not with steady perseverance; kilns of oyster shells have been burnt and strewed, and in some few instances stone lime has been imported, the profits of which, when the cost is calculated, I deem a little doubtful.

The extensive marshes in our tide-water district, in their present condition, form the principal impediment to rapid improvement. It is there that malaria, that frightful scourge of our native population, and the terror of strangers, is concocted. By reclaiming our low grounds, we should greatly improve the health of our country, increase its wealth, and expel the present troublesome holders, musquitoes, snakes, minks, and muskrats. Their title is merely possessory, and not better than that of the native Indians. Vattel held, and his dogma has been received by many of our practical jurists, that savage nations who mix no labor with the soil, but depend upon the spontaneous fruits of the earth, and the beasts of the forests, to supply their wants, may be justly expelled by a more thrifty race, who, instead of the bow and the tomahawk, use the axe, the mattock, and the rifle.

Many of my acquaintances have gone to the west and south, in pursuit of fortune. I have a strong and abiding affection for my native state, where our fathers lived in peace, and in honor, and where in the rare instances in which injury was punished by requital, the manner in which it was conducted lessened the horrors of the act. In addition to my local attachments, in my youth I had a strong objection to having my head disfigured by an Indian tomahawk, and in more mature age I should feel equal reluctance to receive a gentle squeeze from Judge Lynch.

To reclaim our marshes has long been with me a favorite project. If my memory serves me, Swift was contemporary with Marlborough, Bolingbroke, Harley and Wharton, distinguished patriots of that day; and yet he, who had weighed and measured these illustrious men, and many others of equal merit but of lesser note, gave it as his opinion, that he who should cause two blades of grass to grow, where but one grew before, rendered more service to mankind than the whole race of politicians. Now if my poor counsels should prevail, and call up a spirit of improvement by which timothy and herds grass should be made to grow where flags and rushes grew before, I think in justice I may claim to be preferred to subtreasurists, bankites, and conservatives; the goodness of whose intentions it would be uncharitable to doubt, as they all declare that their great object is to promote the general welfare, by giving the people a sound unfluctuating currency. It is deeply to be regretted that men who desire to do right should so widely differ as to the means.

It appears from the Register that your theory is, that the marshes of the Chesapeake, consisting of vegetable matter, upon being ditched and dried, would rot away. The earth I believe is the foundation of all vegetable growth, of which from the tides, and the floods, there is a regular accretion. I have lived long enough to have seen parts of marshes without the aid of art reclaimed from the tide, and produce the grasses of the upland. It is certainly true that a large portion of our marshes, like those of eastern Virginia, consist of decayed vegetables, mixed with earth; but I have learned from respectable authority, that some marshes on the Delaware, in character like ours, upon being ditched, dried and sown in herds grass, become firm and cohesive, and produce excellent crops; this grass by its tenacious roots forms a strong turf, which affords protection against the sun, and frost, and perhaps if Mr. H. Carter, instead of cultivating his reclaimed grounds for seven successive years in Indian corn, (thereby exposing them naked to the sun and frost,) had laid them down in herds grass, he would have experienced a different and more beneficial result.

By a communication to the Register a year ago, I learned that the marshes of Lincolnshire, and the fens of Romney, have been reclaimed by the means of wind mills. This is certainly a most beneficial application of the wind; and I apprehend the same means would produce the same result in the marshes of the Pocomoke, Nanticoke, and Choptank. Maryland is a state small in extent, and limited in means, but her projects are vast, and her views magnificent. By internal improvements she calculates to secure the entire trade of the Susquehanna, a large portion of the Ohio and Mississippi, and to divide with New York and Quebec the riches of the western lakes. Maryland has stated her credit for many millions on canals, and rail-roads, and it would well become her fostering genius to expand her wings, and to apply a few hundred thousands to reclaim her waste marshes. Many of them are still vacant, and the state holds the title; those which have been granted, she might appropriate to herself, by condemnation. When the work was accomplished, and these now barren wastes are set in timothy and herds grass, the state could sell them out at a heavy advance, which would not only pay the costs of the wind mills and ditches, but would leave a heavy profit to the state. This is not a scheme of mere total profit, but of general utility; the western shore would feel the benefits, which would perhaps extend to Philadelphia, and New York; thousands of fat bullocks would be brought into market, from lands which are now worse than useless. The odious monopoly of western graziers, (which I much fear the patriot butchers of Baltimore will be unable to dissolve,) would be at an end, and the Baltimorian would eat beef of very superior quality at low rates. Eastern shore men know, though western shore men do not, that cattle, which can eat salt and fresh grass, and drink salt and water, at pleasure, fatten quicker and make viands more savory, than those of the high country, where salt is dealt out with a parsimonious hand. Salt in its congelation, either by the power of the sun or fire, contracts impurities of which it is clear in its aquous state; and pure sustenance is as necessary to the health of of a beast as to a man. The principal sanative ingredient in the waters of the Saratoga spring is salt, which has never been successfully imparted to medicated waters. It is for these causes that Governor Stevens' sheep are the crack of the Baltimore market, and so much preferred by the epicures to these raised on Elkridge, and Big Pipe creek. To this another important consideration may be superadded; Maryland holds a deep stake in the Eastern Shore Rail-Road, which she increased last session, and which she will probably continue to increase, until it shall be finished, as the private stockholders, either for want of faith, or want of funds, commit heavy forfeitures, and if peradventure when the road is finished, the great communication between the north and the south, should take another direction, the loss might be compensated by taking fat beeves to market in the cars. They would arrive in Baltimore fresh and unjaded, and in fine killing condition, and the risk of being drowned, or blown up from steamboats entirely avoided.

If our salt marshes were reclaimed, and set in timothy and herds grass, the Eastern Shore of Maryland for its extent of territory would become the most valuable in the United States; the hardy Germans, the laborious Dutchmen, and the sturdy Irish, who now go trooping to the west, attracted by the smell of fine sweet hay, which they love almost as much as the smack of whiskey, would come into our country; this supply of free labor would enable us to send our blacks to Cape Palmas. The abolitionists would have to go further south for experiment, and in the height of our prosperity, with fine salt-water navigable rivers, abounding in fish, oysters and wild fowl, and a fine level rail-road, we would laugh at the vain babblers of the great valley of the *Mississippi*.

TIMOTHY.

E. S., Md., 26th June, 1839.

EARTH WORMS—MOULD.

From the Genesee Farmer.

The increasing number of earth worms (*lumbricus terrestris*) in the cultivated parts of our country, has drawn the attention of many farmers to the subject, and elicited some inquiries as to the effect of their presence in such numbers in soils that are cropped. The opinion of some seems to be, that while they confine themselves to the soil, they are harmless, if not actually beneficial. Loudon says that this worm, "unless existing in great numbers in a single place, cannot be ranked among injurious animals, notwithstanding the prejudices of farmers and gardeners against them. Without worms, the earth would soon become hard, cold, incapable of receiving moisture, or of giving nourishment to roots. They are, in fact, the great promoters of vegetation, by boring, perforating, and loosening the soil beneath, and by manuring it above with their excrement, which is thrown up into lumps called worm casts." It is to this latter process, the throwing upon the surface of these casts, or excrementitious matters, as they are supposed to be, that some modern writers have attributed the formation of mould, or that part of the earth which is of the most value in supporting vegetation.

Mr. C. Darwin, F. G. S., in a paper read before the London Society in 1837, was the *first*, we believe, to reduce this theory to a form, by an explanation of the manner in which this worm is supposed to produce the results attributed to it. His attention was called to an examination of the process by finding that some fields over which lime and cinders had been spread on grass land, and which had never been ploughed, were found, after intervals of twelve or fifteen years, to have these coarse materials covered with mould to the depth of three inches.

'This layer (of cinders and lime) was in some places so continuous, that the superficial mould was only attached to the red clay subsoil by the longer roots of the grass.'

"On carefully examining between the blades of grass, in the fields above mentioned, the author found that there was scarcely a space of two inches square, without a little heap of the cylindrical castings of worms. It is well known that worms swallow earthy matter, and that having separated the serviceable portion, they eject the remainder at the mouth of their burrows."

With all deference to the opinions of Messrs. Loudon and Darwin, we are disposed to dissent from both, and believe that the earth worm is more or less injurious, according to its numbers; and that the agency it has in the production of mould is very limited, if indeed it is sensibly felt at all.

We imagine the opinions of practical farmers and gardeners in matters that belong purely to observation and fact, are entitled to great respect, however unable they may be to give reasons or philosophize on such facts. Now we have never known a farmer or gardener that did not consider the earth worm a nuisance; and scarcely one that did not think that they were exhausters of the nutritive qualities of the soil in which they abound. That they bring earth to the surface cannot be denied, but that such earth is rendered more valuable by being divested of its nutritive qualities (or 'serviceable portion' of Mr. D.) in its passage through the worm, may well be questioned. Nothing, it seems, is added to the earth; the matter on which the worm subsists is taken from it; and from the circumstances in which the worm is found, and propagates in the greatest numbers, it seems plain, that the parts of the soil the most essential to plants, are precisely those on which the worm exists. We have no evidence that the worm is injurious by attacking or feeding on the roots of plants; the injury is effected by diverting from them the nourishment they would otherwise receive. Different kinds of vitality cannot well exist in the vicinity of each other; it is a law of nature, that the weaker and less perfectly organized, must give way to that which is higher in the scale, and hence the roots of plants are illy fitted to contend with the more voracious lumbricus.

We are equally skeptical, as to the alleged fact of our being indebted to the earth worm for the mould with which the face of the earth is covered. We think such is not the case, because no where is the richest mould more plentiful than in places where an earth worm was never known to exist. New countries are notoriously destitute of earth worms. Every one who remembers the original soil of this country when the forest were first removed, will recollect the abundance of mould, and the total absence, except in some few places, of the earth worm. We loved to fish in those boyish days, (we have not entirely lost the relish yet,) and well remember the difficulties we were compelled to encounter in procuring worms for bait. They then existed only in little miry spring spots near the lakes, and old, black looking, antediluvian fellows they were. They first began to make their appearance some ten years after the settlement of the country, around barns, and in yards where manure and animal matter kept the earth rich and moist, and they have now in some places taken possession in millions of our lowlands, gardens, &c. Places heavily manured are the most infested by them, as the young worms, or the ova, are brought with the manure applied. Instances are recorded in this journal, in which these worms have so accumulated around houses and in wells, as to render the water unfit for use. Their presence in wells is to be accounted for from the habits of the animal. When there has been a summer shower towards evening, as soon as it is dusk the worms issue from their burrows, throwing up numerous casts in clearing their holes from the washings of the rain, and creep in every direction over the surface. Penetrating every opening where moisture exists, the well serves as a trap for them, and in such openings they accumulate till necessity compels the owner to clear out his well, and thus free himself for a time from the nuisance. Where they appear in such numbers, close curbing and banking is required to shut them out.

Quick lime would undoubtedly destroy them, could it be applied to them in that state; but ensconsed in their burrows, lime spread on the surface does not reach them. Perhaps applying it pretty liberally along the walks of a garden, or between the rows of plants, after a shower, and while the worms were on the surface, might kill some of them; but probably the most effectual remedy will be ploughing so late that the ground will freeze hard immediately after the work is done; and using no manure that has not been piled and heated by fermentation to such a degree as to destroy what worms and eggs may be existing in the mass.

SILK CULTURE COMMENCED IN UPPER CANADA, BY A LADY.

By the following letter it will be perceived that the silk culture has reached Canada, and has found, at least, *one* active and efficient practical advocate. We wish there were *many such*,—and from the zeal manifested by the lady writer, we have no doubt that we shall, ere long, be gratified with the intelligence, that others, are following the example of our fair pioneer, in this laudable enterprise. Should the Canadas become a silk growing country, (and we see no reason why they may not,) this lady will have the proud satisfaction of being the prime mover, and patroness of this elegant and useful production, and her fellow citizens must unanimously pronounce, that she "has deserved well of her adopted country."—*Ed. S. C.*

St. Thomas, U. C. May 6th, 1839.

F. G. Comstock, Esq.—*Sir*:—From the interest you feel in the culture of silk, and the pains you take to diffuse knowledge in every branch of it throughout the United States, I presume you will not be entirely indifferent to a solitary experiment in Upper Canada. Frigidity seems to be associated with the very name of Canada—even Canadians themselves imagine that the climate north of the lakes is not congenial to the mulberry tree, except the black, of which there are fine trees in the forest, which are transplanted for the fruit. Five years since, I sowed the first seed, (I suppose,) that was ever deposited in Canadian soil, in full faith, that it would do well. I offered seed to others, and assured them, that where Indian corn would grow, that the mulberry would, (and more plentiful crops I have never seen in any part of the United States I have been in, than are here produced,) and that if the culture of silk could be made a profitable business in Vermont and Maine, it certainly could here; but one person only, has been induced to sow the seed, and he has a fine nursery of fourteen or fifteen thousand trees, from seed planted two years ago. The profit was no object with me, my premises being too circumscribed to realize any thing in that way. Last summer, I had the satisfaction of demonstrating that both the climate and soil of Upper Canada are congenial to the culture of silk, and the pleasure of exhibiting to all who had the curiosity to call, the first silk-worms reared and the first silk made, from the first mulberry trees cultivated in either of the provinces; and feel myself amply paid for time and cost, in having been able to do it. Resolved to serve a thorough apprenticeship, I superintended the cultivation of the mulberry, and devoted all my time to the worms, guided entirely by the directions in your valuable paper, and Mr. Cobb's Manual, having never seen any thing of the business. The woms were as large as are described, and perfectly healthful, of which I had 2000, and between 200 and 300; not more than 10 or 12 died, and those during the last moulting. The silk is strong and of a fine lustre. The worms commenced their labors on the 28th day, and on the 31st, ten cocoons were formed. The thermometer during the time of their existence, except two nights, was between 70 and 80° hanging in the house.—St. Thomas is in Lat. 42½° and 8."

Apprehending I had too great a number of worms for the foliage, I did not very closely examine the litter, and had it thrown upon the hedge; between 20 and 30 worms were discovered there, which grew even faster than those in the house, until they had attained half their size, when they, one after another, disappeared, till they were all gone except two, which grew larger than those in the house, and had begun to form a cocoon, but the next morning both were gone; they were carried off, I suppose, by birds, as no dead ones were ever found. I have been thus circumstantial, that if any one else should be induced to attempt the culture of silk in this province, and apply to you, sir, for your opinion of success, to furnish you with information of one successful instance. At present, the public mind is too much occupied with warlike turmoils, to take any interest in this new branch of rural economy, but I think there are some individuals, whose skepticism is removed and who will undertake it.

I have already given you a longer communication than I intended, yet I am desirous of informing you of the management of a part of my hedge, the exact manner of which, I have not seen in the Culturist, and may possibly be of use. Two years ago, I employed an English gardener, to transplant some seedlings to complete the hedge around the premises; he suggested to me that setting them in the same way they practised in England with the thorn, would be the best way to cultivate the mulberry; and I directed him to set a part of the plants in that manner, which so far exceeded the others, in rapid growth and luxuriance, I regret the whole had not been done in the same way. He says, they ought to have been cut off last spring within about 3 or 4 inches of the roots, which I have had done this. He first threw the earth up with a spade, as the beds are for garden vegetables, about six inches, and laid the plants horizontally six inches apart, and covered them with 7 or 8 inches of mould,* and then put down another layer between the first plants, and covered them about 8 or 9 inches deep.

I am happy to hear of the progress of the silk culture in the U. S., and feel a peculiar interest in the success of my own native state, Massachusetts, and should be much pleased to see the Canadians engaged in the same business, and imitating the zeal and enterprise of their translake neighbors.

Most respectfully, Sir,
Your most obedient,
BETSY M. BOSTWICK.

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* Leaving one bud on the edge uncovered.

THE NEWEST AND GREATEST HUMBUG YET ANNOUNCED.

From the Maine Farmer.

Gigantic Clover.—A late number of the London Globe, contains the following account of a new species of clover, the seed of which has just been brought into that country from Asia:

"A gentleman has just arrived from Georgia, who has brought with him a new *colloosal* and prolific clover seed from Buckhara, which he is going to submit to Mr. Loudon. According to the accounts of the most celebrated travellers, who have visited that distant and important country, which is equal in climate to Great Britan, *all* grains, herbs and vegetables distinguish themselves by their gigantic growth. The clover seed just imported, grows to the enormous height of twelve or fifteen feet, and can be cut every month: But this is not the only valuable property of this most extraordinary production of the vegetable kingdom. Out of the stem a hemp is prepared, which is so highly esteemed in the distant region of of which it is a native, that preference is given to it over all other sorts.

Should the plan succeed in England, and of which there can be but little doubt, it will form a new era, by rendering this country independent of foreign supplies of clover seed. It is fortunate that it has arrived in time to be tried this year. It must be sown in April. It is said that each grain will produce 300,000 seeds."

We advise the humbug dealers of this country, such as have originated the selling of "Chinese tree corn," *for charity*, and are selling multicaulis seed, &c. &c., to hasten by all means to possess themselves some of these wonderful clover seeds; or, if that cannot be done, to *call* some other seeds by the same name, which will perhaps serve as well—especially if they should be carefully *baked*, or otherwise sufficiently heated, before being sold, to prevent the purchasers being disappointed in the *character* of the product. But whether baked or raw, they should of course be sold without any guaranty of the character or vitality—and for at least as high a price as *two-crop mammoth silk-worms eggs*—or otherwise we doubt much whether the greatest demand will be secured.

ADVANTAGE OF LATE SOWING OF BEARDED WHEAT.

To the Editor of the Farmers' Register.

Madison, June 21st, 1839.

Having uniformly failed in the culture of bearded wheat, without knowing at the time the cause, and knowing that many others have been as unsuccessful as myself, I have determined to assign what is said (and what I believe) to be the cause. *It is early seeding.*

When I commenced farming some six or seven years ago, I was induced to sow twenty bushels of this wheat, which in consequence of being on wet land, was sown as early as the 10th or 12th of October. Its appearance in the fall and early in the spring was beautiful; but it quickly declined, and I do not think that I reaped twenty bushels. On the contrary, a friend of mine sowed a lot of four or five acres last year, which was seeded some time in December, which is now the finest crop of bearded wheat I ever saw, although it did not come up until this spring.

Upon inquiry I find that our neighborhood furnishes other instances of its successful culture when sown late; when upon the old system of early sowing an abundant crop of disappointment was the farmer's only return. I feel confident, Mr. Editor, that the above fact will be well known to many farmers, but still there are many to whom it will not be, to whom it will be important, as almost every farm has some land upon it, which yields no other wheat crop worthy of the farmer's attention.

Whilst on this subject, I will suggest to your subscribers the propriety of a free interchange of ideas on agricultural subjects. Most farmers seem to forget that there are constant additions to our agricultural ranks of those whose previous occupations have debarred them from that experience which is necessary to insure success, and that this deficiency can only be supplied by the experience of others, disseminated through our agricultural journals. It is this which gives an importance to many seeming unimportant facts, as the relief which many a novice has gained, when in trouble, will abundantly attest.

QUINTUS BARTOW.

N. B. For fear that some may be misled with regard to the time of sowing (as December is mentioned above) I must say that from the 1st to the 10th of November is with us preferred.

SILK-WORMS FED ON WET LEAVES.

To the Editor of the Farmers' Register.

I have noticed for some past every thing written on the subject of feeding and raising silk-worms, that I could come across; and I believe the practice of feeding worms on wet leaves has been universally condemned; but in defiance of all the reasoning on the subject, and the condemnation of wet food, I have followed it, so far at least, with great success. I have never raised a great many worms it is true, but it may be supposed, what would affect a large number ought to affect a small number. I will give you the manner in which mine were fed, and you can exercise your own pleasure about believing what I state, though if necessary I can bring ample testimony to establish every word I say. I do not wish to be understood, however, as recommending wet food as the best for silk-worms; but my opinion is, that wet leaves, occasionally, when it cannot be avoided, does no injury to them; as, for instance, in the long season in May, such as we had this year, my worms did not suffer at all that I could observe, from comparing them with others, where a good deal of pains had been taken. I gathered leaves for my worms every day 'till I would have a sufficient quantity left to pass over one or two days; and as soon as they were brought home, if in the morning they were sprinkled with water and laid in the shade, (for I have no cellar,) and if brought at evening they were put out on the grass in the yard for the dew to fall on them to keep them moist; and with these wet leaves the worms were fed four times a day, as much as they would consume; and out of a lot of 10,000 I am confident that I did not lose more than fifty, save some that got injured by moving them about; for I had no fixtures at all for them except some boards. About 5000 of these worms, however, had been half raised before I got them; but when they came to me they shared the same fare with the others I had, of the same age, but considerably larger, and spun something earlier. Finding that the worms appeared to eat more greedily the moist leaves, I continued to moisten them and keep them so, and I never saw worms grow faster, or do better.

Last year I raised sixty worms only; and from a few days after hatching, they did not know what a dry leaf was, and they did remarkably well. In fact, the leaves, for this small parcel, for longer preservation, were kept sunk in water, and merely shaken well when about to be used. Of these worms, only one was lost (being killed by falling,) and the other 59 spun good cocoons, and furnished as many moths. Of these 12 only were females; out of their product I had this year between 3000 and 4000 worms. I did not pay as much attention to them as I did to the lot of 10000, in keeping them as well fed and cleaned; and out of this lot I lost about 100, (that died,) but I do not think more; I do not attribute the loss of this 100 to the wet food, but to the filthy state I let them get into; they were not changed from the old hurdles or cleaned off for nearly three weeks. Had the same pains been taken with the last as with the first lot, it is my candid opinion not one would have been lost from disease. The cocoons were firm and good, (better than those exhibited here by Mr. Gay as the best quality of northern cocoons,) but were smaller than the others, orange-colored, from the gray worms. These are white worms, and the cocoons of pale straw color. I am now feeding a few from the second hatching this year, and I make it a point every time they are fed to wet the leaves, this I do to test the thing thoroughly; they are doing very well as yet, though they are small; and they have not come to the most critical period of their life; if they do well, and you think it worthy of notice, I will let you know.

If these remarks are worth your attention you can use them as you please.

Respectfully.

A. L. ARCHER.

Petersburg, July, 1839.

[Mr. Archer is mistaken in supposing that feeding with wet leaves has been *universally* condemned—though the practice has been tried by but very few persons, and still fewer have reported favorably. Among these few, though not in the Farmer's Register, is our correspondent, T. S. Pleasants, who this spring fed part of his first hatching on wet leaves, for experiment, and, like Mr. Archer, found no ill effect therefrom. But though not universally, the practice has been very generally and very strongly condemned, and certainly by every author who has written directions for silk-culture. This precept first came from Europe, and doubtless is necessary to be strictly observed in that moist climate. If not necessary here, or at least if it may be partially neglected without certain loss—and that the experiments of Messrs. Pleasants and Archer go conclusively to establish—the fact furnishes a new proof of the great superiority which we have in the greater dryness of our climate, which seems to counteract the evil of too much moisture in the food and litter. Without supposing that there is any *benefit* to the worms in the water given, there will be a great gain to the feeder in his being relieved of all the trouble of drying, and delay in feeding, usually caused when the leaves are made wet by rain. The most interesting part of this statement, is that two successive generations of worms have been thus fed almost exclusively on wet leaves.

Though Mr. Archer is a young silk-culturist, and has had very little opportunity to gain instruction from experience, there is no better authority for facts, and his testimony on this fact is as conclusive as if he had stored up all the existing knowledge, and errors, to be found in books, and also in old usages. If he had been previously more fully instructed and strongly impressed by all established authority, he would probably never have made this interesting and useful experiment, of a practice, which all authors, from Dandolo down to D'Homergue, would have pronounced an egregious error, which could not have any other than fatal effects. This is is one of the thousands of cases, which we so much wish that all our readers would imitate, in which even a beginner, a mere novice in a particular agricultural pursuit, may make observations and ascertain facts, the communication of which will afford new and important light to long experienced and the best informed culturists. There are very few observing men, who cannot teach some new and useful truths; and there are still fewer, even of the best informed farmers, who are too wise to be instructed by the communication.—ED. F. R.

REMARKS ON THE USEFULNESS OF BIRDS IN AGRICULTURE AND GARDENING.

By G. Ord.

From Loudon's Gardener's Magazine.

I have been reflecting much upon the conversation which we had together, a few evenings ago, on the subject of the usefulness of birds to agriculture. The farmers of Great Britain, as well as those of North America, are influenced by prejudices which a little investigation of the economy of nature would tend to remove. The rook is by many esteemed a noxious bird; and yet his services, in the grub-destroying way, are beyond estimation. There is no knowing what would be the disastrous result of his extirpation. The common sparrow is a favourite bird with me. Were I an English farmer, I should encourage this industrious and lively little fellow to take up his abode with me, under the full persuasion that the little grain he would devour would be more than compensated by the thousands of harmful insects that he would destroy. The sparrows have entire liberty at Walton Hall, *the seat* of our friend, Charles Waterton, esq.; but we hear no complaint of their depredations. Even of the choice fruit they take but a little, and *this is* not begrudged them by their generous protector.

When residing in the interior of Pennsylvania, I made an interesting experiment. Being fond of rearing poultry, I had a large stock at seed-time, between four and five hundred domestic fowls. My wheat field was near the house, and my farmer maintained that, unless the fowls were locked up, there would be no crop. Not being *disposed* to imprison my favorites, I gave orders to sow a piece of ground alongside the barn, about half an acre, with wheat, for the sole use of the poultry. I must confess that I did not suppose many grains would have the liberty of vegetation, so thorough a scratching did the place undergo. However, the wheat began to spring, and gave indications of a crop. When the grain was ripe, my farmer said he thought it was worth cutting, as it appeared to have received but little injury from the fowls. In short, the damage done by the fowls did not, in our estimation, amount to two bushels of wheat, whilst we had the benefit of the produce of the poultry in eggs and chickens, of far greater value than what they destroyed in the way of grain; to say nothing of their invaluable services in the insect-destroying way. My farmer was greatly astonished; and confessed that the *hens*, as he called them, were not so destructive as he had always imagined they were. I must observe that it was my practice to feed regularly my poultry; under the persuasion that a good meal was quite as beneficial to the fowls as to my*self.* Let all those who attend to rural economy pay attention to this matter, and they will find their interest in it.

In my late journey into Holland, I had the gratification of observing the good feeling of the Dutch, with respect to the feathered creation. Their fondness of the stork is well known; but they also protect the rook, the jackdaw, the wood pigeon, &c. In Rotterdam, I lodged in a hotel, situated on the quay of the Meuse, called the *Boompjes.* This quay is ornamented with a row of venerable trees, which are inhabited by jackdaws, ringdoves, starlings, and sparrows; all living in friendship, building their nests and rearing their young, in perfect security. A stranger, unaccustomed to such a spectacle in a busy commercial city, would be surprised, as I certainly was, on being awaked, at early dawn, with the cawing of the daws, the chattering of the starlings, and the cooings of the doves, in a place where no sounds would be expected but those which are the concomitants of a maritime port. Whilst sitting in my window, to enjoy the morning air, the ringdoves would alight within a few feet of me, without manifesting the least alarm; thereby affording me an opportunity of admiring the graceful form, and glossy plumage, of this beautiful bird. I really envied the Dutch their happiness in this particular.

London, May 10. 1839.

NOTE ON THE JALAP PLANT OF COMMERCE.

By D. Beaton.

From Loudon's Gardener's Magazine.

At the last November meeting of the Botanical Society of Edinburgh, Dr. Graham stated that *Ipomœa purga* is now believed to be the plant which produces the true jalap of commerce. That he received a tuber of it from Dr. Christison, which flowered freely in a stove, and proved to be quite distinct from the *Ipomœa* a hitherto in cultivation in our stoves as the jalap plant. In the *Annals of Natural History* for this month, in which I read a notice of the above meeting, the authority for the specific name *purga* is not stated, and I cannot find it in any work to which I have access. The true *Ipomœa, or Convolvulus Jalapa,* was cultivated in the Chelsea Botanic Garden in Miller's time. After his death, the plant was lost to that garden, and to the collections of this country. Sometime afterwards *Ipomœa macrorhiza* usurped the place of the jalap plant in our stoves. Curious collectors latterly had each his jalap plant in his stove. At Haffield, we had our jalap plant, but not *Ipomœa macrorhiza,*

My present esteemed employer received a few tubers last year from his Mexican collector: they were from Xalapa; and from the appearance of their foliage, when they began to grow, I took them to be a species of *Dioscorea,* (the venation of the leaves in that genus being no index to its botanical affinity), and paid little attention to them. One I kept all the season in the *Cacti* house where it flourished well, and seemed quite at home, but did not flower; another I planted in the open garden, against a rhododendron bush, a good plan for all duplicate novelties from such a country as Mexico, from which both hardy and tender species have been received. This latter plant showed a considerable number of flower buds in September, in twos and threes on short peduncles in the axils of the leaves. Only one of these, however, expanded, owing to the lateness of the season; and it had a long narrow tube, and a spreading medium-sized limb of a delicate violet color; and the plant altogether appeared a graceful climber. You may guess my surprise, on sending this flower to one of the first botanists of the age, to be told that it was the plant which produced the true jalap of commerce, *Convolvulus Jalapa.* I think from this statement we may safely infer that the true jalap plant will flower better in a cool house than in the stove. I expect our plant will flower well out of doors this season, being preparing it now for that purpose. It was received last year in May, and, of course, lost much time of the grôwing season. If this is different from the Edinburgh I. *purga* I shall be glad to send a dried specimen of it to the Botanical Society there; but I shall learn this "time enough" from Mr. M'Nab, I am happy to see, is one of the councillors of that society.

Kingsbury, April 6. 1839.

TO KEEP SWEET POTATOES.

To the Editor of the Farmers' Register.

Columbus, Ga.

Some time last fall, as well as I now recollect, one of your Virginia correspondents asked for information upon the subject of keeping sweet potatoes through the winter; and perhaps the writer was desirous to obtain Virginia practice; but if our Georgia plan should not be altogether applicable to your region, (I know of no reason why it should not be,) your correspondents may derive some useful hints therefrom; and though I give our plan too late for any practical use the present season, it will, if at all, be of service the coming one. There are various modes adopted in Georgia for saving potatoes, but as the one I practice, in common with many others, has always been so successful, I shall describe that only. As soon as the frost slightly affects the potato vines in the fall, (about the middle of October here,) I begin to make preparations for digging; and by the time the vines become thoroughly killed, I am prepared for the harvest. I select an elevated piece of ground, and throwing up circular mounds, or hills, twelve or fifteen inches above the common surface, the diameter of which should be about ten feet, to contain sixty bushels of potatoes. The situation and the elevation of the hills are objects of importance, to prevent the possibility of the potatoes getting wet. In order to make the potatoes lie on the hill the better, the edges should be somewhat elevated by drawing the earth from the centre, giving it slightly the appearance of a bowl. Common pine heart boards are now placed on the earth, radiating from the centre to the circumference of the hill; and on these a layer one foot thick, of dry pine leaves. The hill being now ready to receive the potatoes, I select dry, mild weather, and commence digging in the morning, and stop time enough in the afternoon to haul up all dug during the day; for if left out at night, the frost, if any, would injure them. If possible, the hills should be filled and completed the same day, but if not, the potatoes should be well covered with straw to protect them at night, and uncovered next morning. When the pile becomes two or three feet high, place a pole horizontally across, of sufficient length to pass entirely through the hill. A better ventilator would be an oblong box four or five inches square, with several auger holes in it. The potatoes may now be put on till the pile is about five feet high, and left in a conical form. Next, procure dry pine leaves and lay them all over the potatoes, at least six inches thick. Pine heart boards like those used at the bottom of the potatoes, are now placed over the straw, and a covering of earth six or eight inches thick, is put over the whole, and patted smooth with a spade. A small aperture should be left at the top of the hill, to assist in ventilation; or to be neater, a short oblong box may be inserted down to the potatoes, and the earth drawn nicely up to it. If a pole is used as the horizontal ventilator, the earth should be removed from below it, where it projects from the hill. All the apertures should be left open, for a few days after the operation is finished, and then only closed during severe weather, with a handful of pine leaves. Shelters should be erected over the hills to exclude the rain entirely. I consider it important to perform the whole business in dry weather. P. C. H.

ON THE CULTURE OF THE MUSHROOM.

By Alex. Forsyth.

From Loudon's Gardener's Magazine.

The mushroom is an acceptable article at table all the year round; to supply this regular demand various plans are resorted to, and that which I have proved to be the cheapest and most efficient mode I shall here detail. By cheapness, however, I must not be understood to mean that false economy which short-sighted persons practise, of saving in the first outlay, and afterwards paying a greater sum, as it were, by instalments, or yearly rent, without an adequate return, or the possession of a creditable and satisifactory article. The culture of the mushroom, in many of our gardens, is an admirable specimen of this sort of economy. Instead of building workmanlike mushroom vaults, with bricks, mortar, and cement, not subject to the dry-rot, nor to any other kind of rot, with the look and the reality of stability and usefulness, we find either ridges in the open air, covered with litter and mats, which must be taken off and put on at every gathering, or else, which is worse, the mushrooms growing in a shed behind the hot-houses, on shelves half-consumed with the dry-rot, and the wooden roof over head, as a matter of course, in the same predicament.

Preparing the Spawn.—Cake or brick spawn is the only sort that I consider worth making, and there is only one sort of materials that I think advisable to make it of, and these are, equal portions of horse-droppings, cow-droppings, and loam, well mixed, and pounded or beaten, adding just only as much water as will bring the materials to the consistency of brickmakers' moulding mortar. Then let a circular mould without a bottom, 9 in. in diameter and 2 in. deep, be placed on a table, with the wide end uppermost, and filled with this mortar and stroked level; before it is turned out of the mould, let three holes be made in each cake, with an iron-shod dibber, 1½ in. deep: the mould must be shaped like the frustum of a cone, that the cakes may easily part with it. When the cakes are all but hand dry, let them be spawned, by putting a piece of spawn about the size of a pigeon's egg in each hole, enclosing it with a little of the original mortar. Then pile the cakes in pairs, with their spawned ends together, resembling a cask; and in this state let them be cased up in brick-shaped batches, and sweated and kept up to about 85°, by placing a layer of sweet dung all around and over the batch, varying it in quantity, to obtain the desired heat. The spawn must be examined as it runs in the cakes, and when one is broken and appears mouldy all through, and smells of mushroom, it is mushroom spawn in the highest state of perfection. To preserve it, however, it must be thorougly dried in an airy loft, and kept dry for use. It will retain its properties for several years.

To grow the Mushrooms.—Collect a quantity of horse-droppings, dry them a little in a open shed, then lay a stratum of loamy turf, 2 in. or 3 in. deep, in the bottom of the bed, and over this three layers of droppings, each about 9 in. deep, rendered as compact as possible, by giving each layer a good pummeling with a hand-mallet. When the last layer is made up, thrust a few "watch sticks" into the bed, in order to ascertain when it begins to heat. When the heat is getting pretty strong, let the bed be first beaten all over, then make holes with an iron-shod dibber, 9 in. apart, and deep enough to reach the stratum of loam: these will soon cool the bed; and when the heat has declined to about 80°, the holes may be bored by a conical block of wood, to about 2 in. in diameter, at 2 in. deep, in order to receive the spawn. These holes must be filled up, to about 3 in. from the surface, with loam and horse-droppings mixed; then insert a bit of spawn, about the size of a hen's egg in each, and fill the holes up level with the surface, with the loam and droppings. The holes being closed, the heat will increase, and must be attended to: if violent, a few deep narow holes may be made to let it escape; and, if too slight, it may be aided by a covering of dry hay, or a layer of warm dung; and when all danger of violent heat is gone by, and the spawn beginning to run, put on the upper stratum of loam, mixed with a little cut hay or dry horse-droppings to make a tough *firm crust*, about 1 in. deep. A temperature of 55° to 60°, I consider is best for the atmosphere in the house, and about 90° of bottom heat will set the spawn actively to work. The beds must not be allowed to get too dry, a layer of moist hay will prevent this; and, if too wet, a dry atmosphere can be got by gentle fires and open ventilators, which will aid them a little: but a bed once allowed to get thoroughly wet after spawning is, in my opinion, hopeless; and such a bed I should certainly remove without loss of time. Mushroom spawn, planted in loam and dung, or in either, and screened from sun and rain in summer, will produce this vegetable in abundance; and the same materials will produce the same effect, under favorable circumstances, in winter; such as being placed in boxes or baskets in a stable or warm *cellar*. In gathering mushrooms for present use, they may be cut; but, if they are to be kept a few days, they must be got with the stem entire. *Half-dried* droppings of highly fed horses, good spawn, and a gentle moist atmosphere, are the principal things to be attended to in cultivating the mushroom.

EMIGRATION.

[Extract from the Southern Agriculturist.]

There are few of us who have not relatives or friends that have emigrated to the west, and whose flattering accounts of that region do not render us uneasy, not to say unhappy at our situation here. Many of us have been there ourselves, and their deep rich soil, their luxuriant fields, their boundless discourse of hundreds of thousands and of millions, have seldom failed to make us look back with absolute contempt upon our own barren and spiritless land. With imaginations fired by the glow which rests and shines on every thing around, many purchase at once, and return home to pull up stakes and abandon all the endearing associations of infancy, youth and manhood, for the glorious prospect of unbounded wealth in more favored climes. If any come back to look once more upon his own fields before he determines to give them up forever, and the lapse of time, the change of scene, the comforts of home and friends, wear away his first vivid impression, and deprive him of the resolution to go—*still, in* most instances, the thorn rankles in his bosom, and he feels that he has made an immense sacrifice to his unfortunate attachment to the spot where an unkind destiny has cast his lot. Most probably he yet hopes, at some future period, to break away, and looks upon the soil and institutions of his father scarcely as his own—certainly as not his children's. I invite all such, and all who from the accounts of others may be troubled with this fell spirit of emigration, to follow me in the calculation I am about to make, by which I hope to convince them that the difference is not so great as perhaps they imagine. But first, let them look around and scan more narrowly the circumstances of those whom they so much envy. I do not ask them to look at men who left us with reputations impaired, or broken fortunes. To such men, almost any change is for the better, because it gives new habits, new energies, and above all, new hopes. Their gain is not to be easily estimated—it is moral rather than physical. But look at those who left here "well to do at home," to better their condition. Count their slaves, count their acres, count their children—the noblest portion of their wealth. I do not ask you to count their friends, or to trace the connections which these children may have formed, or to enumerate those sad hours which bear them back to their native land. But ask them how much clear money they have on hand each year, *after all is paid*, and then inquire how much property they can purchase with it. If you can perceive no great accession to their visible wealth or comforts, if they number no more slaves, and have no broader lands bought and *paid for*, what avails any high imaginary value, which in conformity with the fashion of that country, they may place on what they have? and how much sweeter are the bought and barren luxuries of a foreign land, because purchased with more money? Let me ask them to do one thing more if it is in their power, to go and inquire of their friends or relatives, if, laying aside all affectation, and speaking in the honest sincerity of their hearts, they do not wish they had never left their native state—nay, if they do not yet indulge the hope, vague perhaps, but very comforting, of one day returning thither.

GOVERNMENT AND AGRICULTURE IN MASSACHUSETTS.

[From the July No. of the North American Review.]

An address at the Annual Cattle shows of the Worcester and the Hampshire, Hampden and Franklin Agricultural Societies, October, 1838. By Henry Colman, Commissioner for the Agricultural Survey of the state. Boston: Otis, Broaders, & Company. 8vo. pp. 23.

Agriculture, the first pursuit of civilized man, has been the last to receive the direct attention and patronage of governments. Commerce, navigation, manufactories, the mechanic and fine arts, science and letters, had commanded much respect and reached high degrees of excellence, before the cultivation of the earth, either for the purposes of profit or embellishment, found favor among the affluent and enlightened, or was deemed an object worthy of the careful consideration of statesmen and legislators. But, when nations have reached an advanced position in prosperity and refinement, and other more attractive or lucrative branches of industry have been so extended as to employ a large portion of the population, an immensely increased amount of products is required to meet the augmented demand of consumption; and the necessity of rendering the earth more prolific becomes so apparent, that what had been improvidently neglected, and was, in fact, the most substantially momentous interest of the country, at last imperiously commands the most grave consideration.

As the commercial and mechanical enterprise and capacity of England began to be rapidly developed after the accession of Elizabeth to the throne, the demand for subsistence became so much greater than the domestic supply, that vast quantities of wheat were annually imported, until, by bounties, and an improved system of tillage, the wheat crops of the island were so much increased, as not only to be sufficient for the supply of all the inhabitants, but to become a staple of exportation.

Still there was not that general and strong interest excited, for advancing the science and art of agriculture, which has been so conspicuously evinced within the last fifty years, before the great land proprietors actively cooperated for collecting and diffusing intelligence throughout every portion of the kingdom; for, although there had been several eminent writers on rural economy, from Fitzherbert, in 1534, down to the practical and admirable Tull, in 1730, whose successful experiments and valuable treatise form an era in the history of British tillage, very few of the actual cultivators of the soil bestowed any attention on the literature of their profession, till Marshall, Young, Anderson, Bakewell, and Sinclair, became distinguished, by their numerous, interesting, and invaluable publications.

But the greatest, and perpetually operating impulse was given by the establishment of a Board of Agriculture in 1793, when *Surveys* of all the counties in England, were immediately undertaken, in conformity to a method which had been suggested by Marshall, several years before, to the Society of Arts in London. The reports of the several commissioners being very voluminous, as they contained exact details relating to practical operations in every department of rural economy, digests were made to render them more available, by the indefatigable projector and collaborator in the execution of this enlarged and efficient plan for advancing the important interests of the whole country. But even in that reduced form, with the other materials which he had individually collected during a period of nearly twenty years, which had been devoted to the subject, for compiling "A Compendious System of English Agriculture," the work consists of fourteen volumes.

The expenditures of Great Britain having rapidly and immensely increased from the commencement and during the progress of the war which followed the French revolution, and nearly half of the whole revenue being derived from direct taxes and the excise, it became of still greater consequence to the land-owners and their tenants, from whom that vast amount of income was chiefly received, to render each acre more productive, by the introduction of every possible improvement in the science and art of cultivation, which genius and skill could create or introduce, from the practice of any other age or country. Interest, knowledge, and industry were, therefore, actively and zealously united in a common cause, and the beneficial results have been truly wonderful. With a territory whose area is not a third, and whose population is only half that of France, and with a soil and climate not so propitious, the agricultural products of England are quadruple those of that empire. This astonishing difference is owing entirely to the superior methods of tillage which have been so successfully extended over the whole island, and have rendered it the most perfectly cultivated, prolific, and beautifully embellished domain, in all the appropriate appendages which a refined taste in ornamental planting can devise and execute, that has existed at any period in the history of the human race; while, in large portions of France, as well as Spain, Portugal, and many of the Italian states, no favorable change has been introduced since the time of Virgil, and the implements, as well as the whole process of management in rural affairs, is that described by the Roman bard. But, within fifteen or twenty years, the government of France has made highly commendable exertions to elevate the character and condition of its rustic population, by the establishment of agricultural and horticultural societies, experimental farms and gardens, the introduction of new plants, and awarding premiums for valuable experiments in all those departments of national industry.

The same enlightened and patriotic spirit which induced many of the most intelligent and eminent men in Great Britain to combine in an application to Parliament, to aid them in measures for facilitating their honorable efforts to render the labors of the farmer more profitable to himself and more useful to the country, was simultaneously evinced in this commonwealth, and with like happy consequences. The "Massachusetts Society for Promoting Agriculture" was incorporated soon after that which was established in England; and the example has been emulously followed in most of the counties throughout the state, while all have been encouraged and fostered by the seasonable and liberal endowments of the government. Much has been thus accomplished within the present century; but, acting from a yet more enlarged and generous policy, the executive and legislature of the commonwealth, with a munificence which reflects upon them the greatest honor, directed, two years since, an agriculture survey of each county to be made; and a gentleman was appointed as the commissioner for performing that difficult and laborious duty, who, from his attainments, industry, ardor, and practical experience, was eminently qualified for the station.

This may undoubtedly with propriety and justice be considered one of the most important measures that have been adopted since the organization of the government; for it is immediately interesting, and must be directly beneficial, not only to every citizen who depends upon the cultivation of the earth for his support, but to the whole population, of which the farming class constitutes at least seven-tenths, being, at the same time, the grand nursery and constant source of supply for filling all the other diversified occupations in society.

With a soil naturally as capable of tillage, and to as high a degree of perfection as that of any other region, Massachusetts has been dependent on other states for a large portion of the most indispensable products of agriculture, which are annually consumed; not from a deficiency of territory, for, compared with the population ours is double that of England,—nor because it is not capable of yielding a sufficient quantity to meet the demand; but mainly from an imperfect system of husbandry, and the general *disinclination* of the people to submit to the quiet, noiseless, apparently slow and doubtful process of acquiring an ample, independent support, by a perpetual cultivation of the earth. Besides these adverse causes, commerce, navigation, the fisheries, manufactories, the mechanical arts, and the mighty tide of emigration have made rapidly increasing drafts from the agricultural population, and thus produced a continually augmenting difference, between those who consume and those who produce, which has long since made it indispensible to *expend* the wealth acquired from other sources of *income in* procuring supplies from other parts of the union; and ultimately, so great became the disparity between the supply and the demand, that, as a nation, we have been compelled to resort to foreign countries for the first necessaries of life.

It is our duty, then, to make every possible exertion to avert such alarming conjunctures in future; for no nation can be said to be truly independent, and secure in its position and institutions which is not at all times, and under all circumstances, fully capable of furnishing food and raiment, and whatever else is requisite, for the support and comfort of the whole people.

From the first report made by Mr. Colman, there is ample testimony to warrant the assertion that Massachusetts is capable of yielding more than triple the amount of agricultural products which have hitherto been obtained. There is not a county which the commissioner has visited, that has not presented examples of tillage, and experiments in all the branches of New England culture, which fully illustrate the immense advantages that are derivable from a skillful application *of science* to the practical arts of husbandry. This verified and consequently most useful of all kinds of knowledge, but which has been confined within very limited and far separate circles, will hereafter be as universally possessed, through the medium of the reports on each county, as that which has been collected and published on every other subject connected with human industry; and the whole, when completed, in the lucid, exact, and satisfactory manner in which the first has been presented, will, allowing for the extent of territory surveyed, form the most accurate and valuable agricultural cyclopædia which has appeared in any country. It will include the actual operations of each individual, who has best perfected that portion of rural economy to which his attention had been most exclusively directed, from the nature of the soil, and geographical position as respects a market.

Hitherto all the publications which have appeared on agriculture, have been principally compilations from the various treatises that have been written on that all-important subject, since the period of the illustrious Columella; and, however laborious may have been the authors, and ingeniously faithful in design, or desirous of producing a work which might the most perfectly subserve the purposes of the region of country for which it was intended, it is notorious to every experienced and well instructed farmer and gardener, that they have invariably failed to accomplish what had been so confidently anticipated; and it is evident to even the most superficial observer, that there is no other mode of concentrating in a really useful form the requisite information, for the general guidance of the uninstructed as well as experienced cultivators of the earth, and of enabling them to participate in the advantages which have been derived from the most approved methods of conducting the multifarious labors of a farm, than that which has fortunately been undertaken by the government of Massachusetts, and which, from what has already been done, we have the fullest confidence will be thoroughly executed. Each of the most skilful and enlightened experimentalists, whose results will be given in the reports of the Agricultural Commissioner, must have consulted the most celebrated authors, and to some extent taken them as guides, for directing them in their diversified operations; and the benefits obtained will be at the command of every citizen.

The agricultural survey is but the continuation and completion of a system, which has been projected for obtaining accurate information as to the physical geography, topography, natural history, and general statistics of the commonwealth. Massachusetts has been the first of all the states of the union, to cause a correct map to be constructed, based on the triangulation of its whole area, which involves astronomical observations for establishing the latitude and longitude of the most remarkable features and positions, and which, from the difficulties and expense to be encountered, has been applied only in France and Great Britain, to include a whole nation. Happily, however, for the navigation of the United States, the same operation is in progress, under the direction of the national government, for forming complete hydrographical charts of the coast from Passamaquoddy to the Sabine.

Connected with these important labors, a geological survey was undertaken, which has been most ably completed by Professor Hitchcock; and the other departments of natural history, including the animal and vegetable realms, have been directed to be explored, and the duty has been confided to several scientific gentlemen, from whom may be expected full and interesting accounts of the quadrupeds, birds, fishes, reptiles, insects, and plants, which are peculiar to the state.

These works will be honorable monuments of the enlightened and expanded views of the legislature, reflect lasting honor upon the chief magistrates under whose direction they have been so successfully prosecuted, and entitle the enlightened and meritorious gentlemen who have participated in the very responsible labors, to the respect and gratitude of the present and all future generations.

We have indulged so far in the general remarks which the very interesting subject of agriculture has suggested, that there is left only sufficient space to commend to the real friends of the country the instructive address which the Agricultural Commissioner delivered before the assembled yeomanry of several of the interior counties, during the last autumn. It is an impressive appeal to the farmers, urging them strenuously to endeavor to render their condition as prosperous and happy as their pursuits are respectable and important, by renewed efforts in the acquisition of intelligence, and to illustrate, by example, how independent and deserving of the highest consideration are those, who zealously emulate the hardy virtues and rural industry of their adventurous Anglo-Saxon ancestors.

PRODUCT OF MULBERRY LEAVES.

To the Editor of the Farmers' Register.

Stafford, July, 1836.

The cocoonery which you published as mine belongs to the Potomac Silk and Agricultural Company, which was incorporated by the legislature in March, 1836. As the stockholders generally have no experience on the subject of silk-culture, I sign my name individually to communications published, because I am responsible *alone* for the opinions and *facts* set forth in such communications.

I am pleased that you published the statements of Dr. Perrine, because they are calculated to some extent, to counteract the injurious influence of the extravagant and ridiculous statements which have inundated the country for several years past. It is unwise even in speculators to countenance such statements, because they are calculated to lessen the demand for trees, by producing the erroneous impression that they have a very trifling *intrinsic* value. Dr. Perrine's statements, however, I am quite sure are far below the truth. I know from actual experiment that 5000 pounds of foliage can be taken from an acre of land that will produce only fifteen bushels of corn. I came at this result by counting trees (3600 to the acre,) and weighing the foliage from a fair average number. The trees were transplanted, at two and three years old in the spring of 1838, and headed down the following fall.

The account should then stand thus: 5000 lbs. of leaves will produce 25 pounds of silk, worth when well reeled $5 per pound, or in the aggregate $125, from which deduct $2 per pound for rearing the worms and reeling the silk, and $8 per acre for cultivation, the net gain would then be $67 per acre on land that will only give $7 net profit in corn or oats.

That the above named expenses are ample, I know from experience; if the business be conducted with practical hands, and due regard to economy. As the trees get older, if treated properly, they would no doubt yield from 30 to 50 per cent. more.

LAYTON Y. ATKINS.

P. S. Dandolo's statements with respect to varieties of silk-worms are entitled to the highest confidence. In the estimate of profit in silk-culture you perceive that I allow Dr. Perrine's statement as to the quantity of leaves required for one pound of silk, to be correct, although it exceeds numerous actual results in France and Italy. Will you examine and see whether Dandolo or any other foreign writer says any thing about a "two-crop" mammoth?* There may be some honest men who, being themselves deceived, engaged in selling "two-crop" mammoth eggs, but that *all* who are trafficking in mammoth worms and other varieties from the vegetable and animal kingdoms, are "over much righteous," I am slow to believe.

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* We know of none.—ED.

I have just had small parcels of recently deposited eggs of the "mammoth yellow" to hatch, and much larger proportions of new varieties produced by cross fecundation. Now is my time for setting up a *humbug* shop—but all my fair prospects are blighted—my *real* opinion is out and gone, and I have neither ingenuity, nor impudence enough to hide it from public view.

EFFECTS OF LIMING.

To the Editor of the Farmers' Register.

Fairfax county, June 16th, 1839.

My corn which has been made without the use of the plough, is now throwing out the tassel, and is of the blackest green; very little of it is manured, for the land was too remote or precipitous thus to be treated. By the way, I planted two ears of "Chinese tree-corn," upon land well manured and limed; the result will prove it absolutely worthless; and more like a rush than a tree. My wheat is fine when compared with crops made upon the same land without lime. I believe I am within bounds when I say the improvement is from 50 to 100 per cent. My oats *must* make 100 per cent. more than I ever made without lime. My clover is short, but I am cutting it with a view to seed; otherwise I should not cut it. This crop got no root last summer, and the spring was too dry for its growth. Dear old Virginia *must be resuscitated*, and stand forth in *green and gold* among her sisters. The pride of her children gives me warrant of this result.

I can assure you and your readers that the use of plaster of Paris after lime, works strangely and wonderfully. *You* may explain why it is so; for *me*, it is sufficient to see and know that it is so. Where the great father of nature has placed the limit of fertility, when lime, plaster and their produce of vegetable matter is turned back, and reacted upon, time only will show. I shall be greatly disappointed, if the "far west" does not find in the tide-water of Virginia its rival. If I live, I shall make some report to you on the subject. I am amused to see the sharp controversy that is going on in the agricultural papers, about the proper application of manure. My experience of 40 years and more, authorizes me to say, that the difference between ploughing it in, and applying it to the surface is much like that between "*tweedle-dum* and *tweedle-dee*," save that the surface application only takes half, or less than half, of the other. Of course it is not so durable, because of the diminished quantity. Choice however, in the mode of application, with me, is out of the question; for I find that after collecting my spring and fall supplies of oyster shells, and the wood necessary to burn them, I have no choice left; my manure must go out as we can, not as we would. Our timothy grass is bad, unless upon limed land. Upon that it is very good.

I will close this, by remarking that my corn was planted upon a poor field, directly upon the main southern road, and limed for public observation. I have not used plough or coulter in its cultivation. The plough I have long since disused, as a barbarous and inapplicable implement for the cultivation of corn. The coulter, I have, until the present crop, freely used for the early cultivation; this year we had no heavy rain to bake the ground, and it was not used. I cannot speak of the crop, without appearing to speak of my own smartness, which I could not do in good faith to my own convictions; for I assure you, sir, that every day convinces me that I am but an *infant* in the science of agriculture. LIME.

FIRST TRIALS OF SILK-CULTURE.

For the Farmers' Register.

Farmville, June 25th, 1899.

My attention was first drawn to the silk business by a letter of Dan Bradley, republished in one of the first volumes of the Register, and has ever since been directed steadily to it, although the failure of a mulberry dealer in the spring of '37 to furnish 1000 cuttings purchased in the fall of '36, has thrown me back very much in the business. I hatched, on the 29th and 30th of April, what had been purchased for a fourth of an ounce of the two-crop worm; supposing to be from subsequent estimates, about 3000. They were kept at first in a room, the temperature of which could be very well controlled, ranging during the first age from 70 to 80°. Their first moulting took place the 5th day after that of the hatching. They commenced spinning the 25th of May. A few were lost in the fourth moulting by feeding too plentifully before all had recovered from their torpor, and covering, in the litter, those which were latest in moulting. The spinning apparatus was of *planed* laths, as described in the Register by Mr. T. S. Pleasants. It was evidently too smooth, although eventually probably two-thirds spun among the laths. As they commenced spinning much earlier than was anticipated, the ladders had not been prepared; one was hastily prepared across the middle of each hurdle, and the deficiency supplied with sticks. They did not mount well on either. The cord of the ladders was too small; and they were very torpid and sluggish during the whole spinning season, which continued more than a week. After the first two or three days of their spinning, the weather became wet and cold, and continued so, the thermometer being on one occasion as low as 50°, and generally ranging in the morning from 54 to 58° in the house. They had been removed before spinning to a house where no fire could commonly be maintained, and which was too open for the temperature to be controlled even by a fire. Some became so torpid as to be unable to spin; part of these died and a few passed into the chrysalis state without spinning; most, however, were healthy and made good cocoons, mostly white, a few of straw color. Taken as they came from the laths, including some imperfect cocoons they weighed 378 to the pound. Of the straw colored, taken without selection, 290 made a pound; 240 of some cocoons from the common worm, raised by Capt. Stevens in this neighborhood, weighed a pound. The Messrs. Kings fed 30 to 40,000 this season hatched about the first of May. They think they did not lose 100 by disease. About 3000 were purchased as "mammoth white," the rest as "two-crop;" 378 cocoons of these mammoth white weighed a pound. The silk is of glossy whiteness, and reels remarkably well, and although they have no pretensions to the character of *mammoth*, the Messrs. Kings think very highly of the variety. The same gentlemen intend feeding another crop this season. On the 14th and 15th of May, I hatched what were purchased as ¼ oz. of mammoth white, and which are evidently the same variety as those of the Messrs. Kings. They commenced spinning the 16th of June, which was Saturday. Sunday night was very cold, and on Monday morning they were very torpid, and I lost a large portion of the crop. Larger cords had been put to the ladders, and the number of ladders increased, and on Saturday and Sunday they mounted very well; but after that time bushes and broom corn were placed on their hurdles. They seemed to give the preference to the broom corn for spinning, and even for mounting, as some ascended by it and spun in the laths. The eggs of this crop were kept in a cellar until the 29th of April, when a few worms were discovered on examining them, and the eggs transferred to the ice-house and kept there until the 15th of May, when they were taken out, and began to hatch in a few hours after they were removed. Whether the sickliness of this crop arose from the treatment of the eggs or from the cold of Sunday night is doubtful. I shall be able to determine this point, however, as I have a crop now feeding from the same stock of eggs, which were kept in the ice-house until the 25th of May, I feared the vitality of the eggs would be destroyed or their health injured by removing them to my ice-house in that state, but could not feed as large a number so early in the season, and was obliged to hazard the experiment. Another crop in the neighborhood, the eggs of which were kept with mine and hatched the same time, shared the same fate. Several other crops have been fed in the neighborhood, and all except the two mentioned have been remarkably healthy.

I intend feeding another crop of about 30,000 from the eggs of my first crop, some of which commenced hatching the 24th of this month. This is my fourth crop this season. The first hatched the 29th of April; second, the 14th of May; the third, the 25th of May; the fourth, from eggs raised this season, on the 24th of June. Ten days is a sufficient interval between the hatchings to prevent the crops from interfering with each other. I would sell a quantity of the eggs of the two-crop worm raised this season, which are now ready for hatching.

Yours respectfully,
SILAS T. BIGLOW.

ON THEORY AND FACTS. TWO-CROP SILK-WORMS.

To the Editor of the Farmers' Register.

A distinguished writer, on the science of chemistry, has said, "imagination which is ever wandering beyond the bounds of truth, joined to self-love, and that self-confidence we are so apt to indulge, prompts us to draw conclusions which are not immediately derived from facts; so that we become, in some measure, interested in deceiving ourselves. Hence, it is by no means surprising, that in the science of physics in general, men have so often formed suppositions, instead of drawing conclusions. These suppositions handed down from one age to another, acquire additional weight from the authorities by which they are supported, till at last they are received even by men of genius as fundamental truths."

The process of reasoning described in the above quotation, has been a fruitful source of error, and for centuries has opposed formidable obstacles to the progress of the arts and sciences; and it may with truth be affirmed, that no art has been so much impeded by such difficulties, in its progress to a high state of improvement, as that of agriculture. It is no uncommon occurrence, for men, having no practical knowledge of agriculture, to assume the chair of the lecturer, and to deliver their lectures to the agricultural community; and if they fail to pursuade the steady, intelligent and industrious farmer, to fall in with their theories, he is charged with either obstinacy or ignorance. Those who write for agricultural journals should carefully distinguish between *theory* and *fact*. They are both useful when each is kept within its appropriate sphere. The propounding of theories, leads to experiments, and by these conducted carefully, facts are ascertained, and error may be rejected, and truth retained and reduced to practice.

I have on hand, a large supply of *theory* on agricultural subjects, and if I were allowed to pour it forth in an uninterrupted stream, yourself and your worthy correspondents would have to give place, and allow me full and quite possession of your columns, till about the 1st of January next. But if I should unfortunately get the scribbling *mania* to this alarming degree, I hope you will use the editor's prerogative, and apply the proper correction.

It is evident from several passages in the Chinese work on the culture of silk, recently published by Mr. Force, that the Chinese are in the habit of eating the chrysalides of silk-worms. For aught I know, they may make a wholesome and palatable dish, equal to the best fried oysters; but I have a sensitive and very rebellious stomach, and as yet have not plucked up sufficient courage to give the chrysalides, either fried, stewed or boiled, a fair trial. It is therefore *certain*, that I shall be in want of corn and potatoes, pigs and poultry, and I hope that you, and some of your experienced correspondents, will continue your kind efforts to teach the art of raising these useful commodities. That they are wholesome and palatable, are facts well established; but the art of producing them has not reached perfection.

I will now proceed to my main subject which should have been done sooner.

In your article on "mammoth silk-worm eggs," you say "the repetition of hatching which has become a fixed quality, in the "two-crop white" silk-worm, and in other kinds known in tropical climates, is doubtless caused by the long continued action of warmth. In Bengal, it is said there are worms producing ten or more successive generations in a year; and it seems from Dr. Perrine's information, that a similar result has already been produced in Cuba." (p. 377 vol. vii.)

In the general views expressed in your article, I concur, but I object to the theory laid down in the paragraph just quoted. If I believed this to be the true doctrine, I should not regard the "two-crop white," as truly a "two-crop" variety. I believe that in giving two yields each season, it obeys the law stamped upon it by its Creator, and not an accidental habit produced by a warm climate. In some small parcels there might occur an occasional aberration; but the main body of this variety (if kept from mingling with other varieties,) will transmit its distinctive character to the latest generation. In China, they have a worm that moults four times, and gives two crops; and another variety that yields four times; but of the thirteen varieties enumerated, nothing is said about a change of natural habits produced by a variation in climate.—(See Chinese Treatise pp. 96 and 98.)

I once heard of a lot of the common variety (spinning white, orange and pea-green cocoons,) having contracted the habit of hatching two and three times; but this parcel expired by forming cocoons from which the perfect insects never emerged. That the "two-crop white," (the term *white* refers to the color of the cocoon, and not to that of the worm,) will lose the habit of hatching twice by mixing with other varieties, I know from two careful experiments; and if mingled with worms spinning yellow cocoons, the colors will mingle. White worms descend from those that are gray, but if white cocoons are chosen for seed, no other color will be found in the next crop, and so with all other colors. The culturist may select his color and have it perpetuated and unmixed, by selecting cocoons of uniform color. I hold with you, that there is no "two-crop mammoth" in the United States; and until the claimants of such a worm prove it to be really a "two-crop" variety by the experience of ten successive years, I shall remain, as your Fairfax friend, says "Thomas O' Dedimus." By the way, I will say, that I have the highest confidence in "marling" and "liming," because I know that it will conduct those of us that dwell on poor land, into clover to the knees.

We now have theory against theory—let time, and a sufficient number of adequately tried experiments, terminate the conflict.

LAYTON Y. ATKINS.

Stafford co., Va., July 1839.

PROGRESS OF SILK-CULTURE, AND NEW IMPROVEMENTS IN THE MIDDLE STATES.

To the Editor of the Farmers' Register.

During a recent visit to Philadelphia and Burlington, and some other places in the vicinity of those cities, I had an opportunity of observing the state of silk-culture, and of contrasting it with what it was twelve months ago. The advancement has been evident and decided; and the foundation appears to be laid for the general adoption of the business in the contiguous portions of Pennsylvania and New Jersey. In New Jersey especially, the soil is of a quality and composition admirably adapted to the multicaulis. It is light, sandy and deep; not rich, but quick and lively enough to ensure a healthy and rapid growth of the plant, and to furnish foliage of the best kind. There is probably more multicaulis growing in that state, than any other in the union; and almost every person engaged in its culture, whether farmer or shopkeeper, has a lot of worms which he attends with the greatest care. The demand for silk-worms' eggs, particularly the "two-crop," has been and continues to be, very great. They readily command at this time, twenty to twenty five dollars per ounce. One individual near Burlington, who has already raised two considerable crops during the present season, has realized several thousand dollars from the sale of eggs alone. *French eggs* have also been imported in large numbers; and the whole of last year's stock has gone off at high prices. From these facts, some idea may be formed of the zeal with which the good people of New Jersey have taken hold of the business. In the neighborhood of Philadelphia there are eight or ten cocooneries erected; some of them on quite a large scale. The most noted of these is the Highfield cocoonery at Germantown, belonging to Mr. Physic. Nearly all the readers of agricultural papers must have seen some account of this building, which has been described as a *model of its* kind. It stands on an elevated situation, overlooking much of the surrounding country. The exterior has a beautiful appearance; and it is obvious that a great deal of money has been expended in fitting it up. It may well be doubted, however, whether it will, in its present state, fully answer the ends for which it was designed. Every thing is crowded to excess, as if the object had been to rear the largest possible number of worms in the smallest space. The shelves are so wide, (not less than five feet,) and so close to each other, and the passages are so narrow, that there must be great difficulty in effecting a perfect ventilation. The dimensions of the room are about 100 by 32 feet; and it is the intention of the proprietor to feed a million and a half of worms as soon as the leaves are large enough. Should he succeed in carrying them through, it will be the greatest triumph that has yet been recorded in the history of silk-culture in this country. At present the multicaulis on the western side of the Delaware are much smaller than they are on the Jersey side. The river forms the boundary between two formations *totally different* from each other. At Wilmington there is a silk farm and cocoonery belonging to a company, which appears to be under excellent management. They have already fed 400,000 worms on the wild mulberry—a number sufficient to exhaust the foliage to a considerable distance round; but by great exertions they were able to obtain a tolerable supply. Perhaps the largest cocoonery erected for the present year's operations, is that belonging to an incorporated company at Burlington. This ancient city, recently in rather a decaying, certainly not in an improving condition, has put on a new aspect, since its inhabitants have been so extensively engaged in the culture of the multicaulis. From its early adoption of this culture, and the spirit with which it has been prosecuted, it has taken the lead of all other places, and has been able to give the law in every thing pertaining to multicaulis. The stock of the Burlington cocoonery is taken by persons who are growing the trees, each of whom is to furnish his proportion of foliage; the company having no plantation attached to their buildings. The house is two stories high, and 117 feet in length. From the great number of trees grown in the vicinity, and from the judgment and experience of the directors, the most successful results may be anticipated. In the early part of this month, they commenced with about 150,000 worms, under the immediate care of a sensible and intelligent female, from the silk-growing district of Connecticut. The Messrs. Cheneys, whose cocoonery is situated on the Delaware, about two miles above Burlington, are making preparations to feed silk-worms on an extensive scale, and according to the most approved modes. One of the firm is now in France, and another has very recently returned from that country. They went there for the purpose of inquiring into the improvements which have been made within a few years in the art of rearing worms, by eminent French culturists. They are now introducing into their cocoonery the "improved system" of ventilation and feeding, of which M. D'Arcet is the author. Their fixtures were not completed, but as far as they had been yet able to adopt them, the results were not only cheering, but astonishing. M. D'Arcet's mode of warming and ventilating, is by hot air furnaces placed in the cellar, at each end of the building, by which the external air is heated when necessary, and conveyed through pipes into the feeding room above. An equable temperature is by this means readily preserved, and a continual circulation kept up. The Messrs. Cheneys' furnaces were not set up; and in the mean time they were using a common anthracite stove, fixed in the middle of the room, with a long horizontal pipe for the escape of the smoke. The mercury was kept as near as possible at 75 degrees. They were feeding about 250,000 of the common gray worms, the first hatching of which was on the 30th of June. I saw them on the 6th of July, at which time they had gone through the first moulting, and a few were becoming torpid the second time. The worms were fed on chopped leaves, eighteen times in twenty-four hours, with an interval of a few hours' repose in the middle of the night. Under this forcing system, the worms, after showing general signs of torpor, pass through their moultings and waken up with great uniformity in the course of six or seven hours; and their ordinary term of existence is abridged ten or twelve days. The difference in size between worms of two successive days' hatching would be incredible to those who had not seen it. It will be highly interesting to know the final results of this experiment, which it is hoped will be speedily laid before the public; for a minute diary was kept of their treatment and progress. The greatest danger to be apprehended is from the substitution of the stove for the furnace. The effect of stoves with constant fires, as was the case with theirs, and supplied moreover with anthracite coal, is to decompose the atmosphere to a considerable extent. To visitors, the respiration was difficult and oppressive; but it was not so to the attendants who were constantly in the room. That the system of *heated air* however has been highly successful in France, there can be no doubt. I had the gratification of looking into several French works which Messrs. Cheneys had imported; one of which was a synopsis of the treatment and results of rearing silk-worms on this system, under the following title: "*Tableau synoptique, publié sur les auspices du ministre du commerce et l'agriculture. Education hative aprés les methodes de M. Camille Beauvais et les procédés de ventilation M. D'Arcet.*"* The table has a number of columns; the first shows the ages of the worms and the time of moulting; the second contains drawings, neatly engraved and colored, of the progressive sizes of the worms during each successive day, and also of the cocoons, moths and eggs; another column gives the temperature; another, the number of meals in the 24 hours; another, the weight of food, and so on. Some of the results are as follows: the first moulting is on the 5th day, the second on the 8th day, &c. They began to spin in 24 days, in 30 days the cocoons were all formed, and in 40 days the moths had cut out. Until the first moulting they were fed every hour, or 24 times a day; between the first and second moultings 18 times a day. The number of meals was gradually reduced to 8 times a day in the last age. The progress of Messrs. Cheneys' worms was even more rapid than that indicated by the table. Another work contained a "Description of a healthy cocoonery," by M. D'Arcet, illustrated by numerous plates. It is doubted, however, by many skilful culturists in this country, whether we shall derive any benefit from conducting the "education" of the worm, in such an artificial manner as it is under the improved French system. Our climate, they say, is naturally favorable to the rearing of silk worms; and with good care they begin to spin in from 30 to 32 days. But we have frequently weather of several days duration, especially in May, and even as late as the 1st of July, which is cool, rainy and uncomfortable. At such times the worms are greatly revived by the warmth of a brisk fire. They may do well without it, it is true, but they do better with it. The silk-worm has been so long subjected to artificial treatment, that it is reasonable to suppose it cannot be made *too* artificial, as long as its health and comfort are promoted. But this point will be soon settled by the experiments of our people, who are always attempting to discover the shortest way to attain their ends. At present we are in the infancy of the art. We have no system; and as a community, we have but little practical knowledge. Let every one improve the talent which has been committed to him, and contribute his mite to the general stock; and the happiest effects may be anticipated.

July 20th, 1839.

SEASON, CHINCH-BUG AND CHEAT.

For the Farmers' Register.

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Nelson, July 12th, 1839.

Drought distressing in these parts to all crops. Chinch-bug ravaging the corn which had previously wilted from the former cause. Unless rain come soon, we shall have a bad prospect. By the bye—this year, I think, should settle the cheat controversy finally and forever. Whole fields in this and the county of Buckingham, and perhaps elsewhere, which were reaped last year, were this season covered with *cheat*, which grew thick enough in many cases to be mowed for hay; *not a stalk of wheat in the whole.* The drought of last season prevented the shattered grain from coming up on the stubble fields, until late enough to escape injury from insects or other common causes, and the ground about the roots, being uncultivated and hard, or the branches being too thick-set, and roots shallow, or some other cause, I suppose *strangled* the stalks, cut off the nutriment, and so occasioned the degeneracy of the grain. I am disposed to favor the first theory from the fact of a gentleman in Buckingham having, as I learn, reaped 500 bushels of wheat from a stubble field of last year, which had been much rooted up by hogs during the winter, (and thus received what may have been equivalent to a partial ploughing or harrowing,) while the adjacent field of a neighbor, similarly circumstanced, except that it was untouched, produced nothing but cheat.

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* Synoptical Table, published under the auspices of the Minister of Commerce and Agriculture. Hastened rearing of silk-worms, according to the methods of M. Camille Beauvais, and the plan of ventilation of M. D'Arcet.—Ed.

I have heretofore been skeptical on this subject, notwithstanding the decided convictions of many very intelligent and credible gentlemen with whom I had conferred on the topic; nay, had joined in the ridicule of an idea apparently so unphilosophical, so directly opposed to the ordinary proceedings of nature; had even thought it impossible, and that any man of sense who could entertain it, must, *quoad hoc*, be under some strange hallucination. But I yield to the evidence of sense, exhibited on so broad a scale as seems to prevent the possibility of imposition.

THE CHINCH-BUGS.

To the Editor of the Farmers' Register.

Dinwiddie, July 18th, 1839.

The chinch-bugs being so destructive last spring amongst our wheat and oat crops, in different parts of the country, I felt well assured our corn fields would be amply supplied with them after harvest. I then concluded the next time I went to Petersburg to become a subscriber to the Farmers' Register, hoping that some of your subscribers would discover something respecting the chinch-bugs that would be of considerable service to me. My calculation as yet has not been realized, but, take it on the whole, I am very much pleased with it. However, so far as the chinch-bugs are concerned, my calculations have been realized beyond my expectations.

A few days before I commenced harvesting, I was walking over one of my corn fields that contained about forty odd acres, I examined something like eight or ten stalks in different directions of the field, and there were some few on every stalk except two. And they have continued to increase ever since in spots, beyond calculation. Where they had their origin, or where they will end, I leave it to others more competent to tell than I am.

As I am quite a young man, and this is the first year that I have settled down to farming, it is not to be presumed that I shall be able to give as correct and satisfactory an account as you and your readers may desire. It appears that the chinch-bugs made their appearance this last time, some four or five years ago, although there was not much complaint until year before last; and they have continued to increase, and make their appearance much sooner in the spring, and have been more destructive every year since. They are small and black, with white wings. In their form they are close and compact, and appear to be of a hardy nature. I think they are pretty much the size of a bed chinch. Whatever kind of crop they get among they stick around it next to the ground; although I have seen them scattered all over the stalks of corn, the blades, and even down into the bud. There were a great many experiments tried last year, and are likewise trying this year to destroy them, but the result of any experiment that has been tried I am not prepared at this time to speak of with any degree of accuracy. I was informed a few days since by one of my neighbors, that those who examined the old fields early last spring discovered there were a great many chinch-bugs about in the broom straw; and I have heard from another source that a farmer on examining into his old corn stalks discovered a great many concealed inside of the stalk. I am disposed to think that if the farmers would all turn in early next spring and burn over the woods and old fields, and likewise burn up the old corn stalks, it would destroy them in a great measure.

It is the opinion of some farmers that if it should turn in wet weather that they will not be as destructive as they otherwise would be. But it is said by others that the wet weather will do no good; I am inclined to think that the opinion of the former is founded on right reasoning. The greatest quantity I ever saw together was in a farmer's wheat patch soon after the wheat was cut. About in spots the grass was completely killed out, and nearly every kind of vegetation was stuck with them.

DENMARK.

IMPORTANCE OF PROPER SELECTION OF SILK-WORMS' EGGS. DIFFERENCE BETWEEN NORTHERN AND SOUTHERN EGGS.

In the last number, we stated that it was of great importance to a successful result in rearing silk-worms to have eggs of a good and healthy stock, and especially of home or southern, in preference to a northern source of supply. Later and numerous facts have so much confirmed that opinion, that we deem it proper to repeat and to endeavor to enforce it.

The recent and new demand for silk-worms' eggs in this region, induced sundry orders to be sent to the north, the point to which our countrymen send for every thing wanted, even when a little search might provide better articles nearer home. The supplies of northern eggs were furnished to Petersburg, and thence to the adjacent country, from sundry different sources, through different channels, and were of different varieties of worms. There were also several small parcels of Virginian eggs, and a larger stock from East Tennessee. Ten ounces of the latter stock hatched prematurely (beginning on April 13th,) and being unsalable, the eggs were given away to all persons who would take them, for trials of rearing.

By this accidental loss to the owner, a most important gain has been made by the public; for, in this mannner, perhaps fifty or more individuals, who would not otherwise have thought of feeding worms, have been induced to make experiments. Nor were these experiments confined to this neighborhood; for the hatching worms were carried to points nearly 100 miles apart. So far as we have heard, (and careful inquiry has been made,) every person who experimented in feeding these worms, and other parcels from home-laid eggs, (with a single exception which will be hereafter named,) was successful in the rearing, unless with such gross neglect, or bad treatment, that success was impossible. And on the other hand, of all the many previously designed, and mostly more careful and better conducted rearings, from northern ggs bought in, or for this town, *not one* has been uccessful, so far as we have learned; and there are but few that may not be considered equivalent o total failure. The great difference has been in general if not universal healthiness and hardiness of worms of southern stock, and general and sometimes universal feebleness, disease, and finally death, of the northern broods. Such likewise have been the general results elsewhere that we have heard from, but with some few exceptions of healthy and good products from particular feedings of northern worms.

In the various cases under our own observation, or derived from neighboring gentlemen with whom we have frequent intercourse, these results have been the more striking, because in some instances the same individual was eminently successful with worms of southern stock, and as eminently unsuccessful with northern. Sometimes these different results were found in different broods hatched at the same time, kept in the same apartment, and throughout treated alike. We could state particulars of many such experiments, on the most unquestionable authority, which would fully sustain these general statements; but it would be an unnecessary extension of this article, and is not called for, unless the statements should be questioned. Upon the whole, it may be safely asserted, that if the rearings hereabout had been made altogether, (as they were mostly,) from northern eggs, and if there had been no other experience to show different results, that all confidence in the culture would have been lost, and every new beginner would have been discouraged and disgusted, and probably would have abandoned all thought of prosecuting the business. But luckily, there were enough, though smaller and less careful trials, from home-raised stock, to show entirely different and highly successful results; and more especially was it fortunate for the cause of silk-culture, that the accidental hatching of what seems to be the most hardy and valuable stock, should have spread that stock, and established its value, through an extensive region of our country.

One of the most careful and best provided of all the new culturists, T. S. Pleasants of Bellona, was one of those who obtained, and reared with entire success, some of these southern eggs; and he has since lost totally, by disease, the worms of three ounces of eggs, ("mammoth-white,") of northern product. In communicating this and other such facts to us, and stating his concurrence in our opinion as to the general worthlessness of eggs received here from the north, he expresses his astonishment at the strangeness of the facts, and asks whether the change and difference of climate can produce the effects. We think not. Our opinion is, as before stated, that to have a healthy brood of worms, it is essential that the parent stock should have been healthy; and we infer that the northern eggs, sent here, produce unhealthy worms, not *merely* because they come from the north, but because they are generally also the product of feeble or diseased parent stocks. Deeming the climate of Virginia to be much better for silk-worms than that of the states north of Maryland, we should expect that eggs of the same kind, and the broods treated alike, would produce a better progeny, and better eggs from them, here than there. But that would be but a trivial circumstance compared to others which probably are of very extensive if not general operation. Every rearing of worms, even if among the most healthy and productive in general, has many individuals comparatively feeble, which spin cocoons of little or no value, and scarcely worth the attempting to reel. *Being fit for nothing else*, it is probable that these worst cocoons are usually selected *to furnish eggs for sale;* and that to this mode of selection the southern purchasers from northern dealers are indebted for the general worthlessness of the eggs obtained. And if the *worst stock* is chosen to furnish eggs, we may be supplied with worthless eggs even near home, without resorting to the north. Even if such selection of the worst and most diseased has not been actually made by design, it is certain that the recent and present great demand for eggs, has caused the worst as well as the best of every brood to be suffered to produce eggs for market; and thus if a parcel of eggs contained any that were from good and suitable stock, it also necessarily contained a large proportion of the worst description.

The applications of these facts is obvious, and should by no means be neglected by any one who hopes for success. After obtaining a first stock, as carefully as may be, every one should raise his own eggs, and only from the best cocoons, and the most healthy of the worms. And those who have to buy, ought if possible to obtain their eggs from those on whom they can rely for some care and honesty in the manner of producing eggs for sale, and for truth in the characters and descriptions reported.

A single exception was named above to the otherwise universal healthiness and success of worms of southern origin. These were from eggs of one particular rearing of 1838. Of a portion of these we lost every one, (by the contagious disease called "the yellows,") while the worms of two other kinds, (also both southern,) in the same house, did as well as very bad arrangements and rough treatment permitted. Three other persons who were supplied with eggs from that same stock, also lost every one of their worms. These exceptions, so far as they go, seem to confirm the opinion of such results being caused by the eggs being obtained from a diseased stock. For though less likely to occur, a southern stock may be as feeble, or diseased, and as unfit to breed from, as any of the northern.

But even when there is not much disease exhibited in a brood, and when the rearing, if taken alone, might be deemed quite successful, we have found much difference in the *time* of feeding worms of southern and northern origin; and a few days added to the time required for rearing, is alone a very serious objection, on account of the greater expense of labor, of food, and the longer exposure to the risk of injury. We have just finished the rearing of four small broods, for experiment and comparison, of the following different kinds of silk-worms.

No. 1. Southern. Large gray worms, producing orange cocoons, a *second hatching*, from the eggs of one female, laid this season, and of the kind which had hatched first prematurely in April.

No. 2. Southern. Smaller white worms, producing sulphur-colored cocoons, also a second hatching of this season.

No. 3. Northern. "Yellow mammoth."

No. 4. Northern. "Pea-nut" kind.

All were hatched from the 18th to the 20th of June; and the worms were kept on the same table, fed and attended to by the same persons, and treated throughout with equal care; and the results were as follows:

The two southern kinds did very well; some few (not exceeding 2 per cent.,) in their latter stages appeared yellowish and diseased, and were thrown away as soon as observed, for fear of infecting a highly prized stock; and one or two others of each parcel died after beginning to spin. The earliest of the large gray, (No. 1,) began to spin at 23 days old—and the last on the 29th. The smaller sulphur-colored (No. 2,) were about a day later in beginning, and the most sluggish of them were more behind the slowest of the gray. The "mammoth" worms (No. 3,) were not only slower in progress, but smaller at the same times, than the southern gray worms (No. 1,) though they finally reached about the same size. Three-*fourths* of their number were thrown away, as diseased. The first beginning of them to spin was at 29 days old. The "pea-nut" eggs (No. 4,) were *known* to have been of a healthy stock, (raised by S. Whitmarsh, esq., Massachusetts,) and the parent worms had been properly selected for breeding; and from part of the same eggs, T. S. Pleasants at Bellona, has raised this season, and has done well. In our smaller trial, though the *losses* by disease were very considerable, still the rearing may be considered successful as to final product. But these were six days later in beginning to form cocoons than the large gray worms, (No. 1,) and at 29 days old, the first were beginning to spin, with the latest of the others. This is the only case *known with certainty* of northern eggs of best quality, and of a good kind.

The first moths from the cocoons of the large gray worms, came out on the 24th of July, (the 37th day from the hatching of the eggs,) and therefore, from the 13th of April, to July 25th, when the first of the third were laid, there were three successions of eggs in existence, within 103 days. Of this parcel (No. 1,) the eggs were not counted, but it is believed that all hatched, and that the after losses did not exceed, if they reached, 4 per cent. The product was 204 cocoons, nearly all very firm, and of excellent quality. Of the "pea-nut" eggs, 1297 by actual count, about 1100 hatched, and *all* made from them were 485 good cocoons, and 57 soft and imperfect—showing a loss by disease of about 50 per cent., of the hatching.

The greater slowness of growth of the "pea-nut" kind we expect to diminish in our climate, and probably may disappear by another year; and in all other respects they seem to be an excellent kind, inferior only, as we believe from our little experience, to the hardy gray worm. The cocoons of this second brood of the latter are firmer and better than those of the first hatching. If the eggs of these should again hatch, making three successive rearings from the same stock in a year, there will be good reason to believe that this quality of repetition in hatching will have become a fixed quality, and thereby a new two-crop variety produced. The pea-nut cocoons are remarkably firm. The sulphur colored (No. 1,) we would reject, (even if it *has* become a two-crop worm,) on account of its small size. The "yellow-mammoth," if to be judged by the result of this rearing, we consider as feeble, unproductive, and worthless, and not possessing in any considerable degree even the very doubtful merit of unusually large size.

Since the above was in type, we have seen in Morris's Silk Farmer of July 22nd, that the current price in Philadelphia of silk-worms' eggs was "$20 the ounce, on the muslin, equal to $40 the ounce of net eggs." Sundry persons in and near this town have raised eggs, and have them for sale, and have not yet sold for more than at $5 the ounce (actual and honest weight,) for one-crop, and $10 for two-crop eggs. The latter kind can scarcely be prevented from hatching in summer, and therefore have already been mostly lost.

MUD FOR MANURE.

From the Maine Farmer.

Messrs. Editors:—A few years since I read a communication from the 'New England Farmer' on the subject of the leaves of trees as a manure. It was from the pen of a good farmer who, it would seem, employed every method within his power to increase the quantity of his manure by artificial means. This writer stated that a very few loads of the leaves of trees, mixed each year with the manure of the barn yard, is excellent, but that large quantities is positively injurious to vegetation. I think I can state one case which may go to prove the correctness of the statements made by this writer. I have a piece of land which has been for many years improved as a garden. A brook which formerly ran through this garden, but which has changed the direction of its current left a copious deposit of mud, or the matter of decayed leaves of trees.

A superficial observer on examination of the soil of this garden would assert at once that an abundant crop of almost any kind could be raised upon the same. Three years ago I manured this garden with good barn yard manure, at the rate of 80 loads per acre. I expected that the succeeding crops would be very great, but I was disappointed: my crops in my other fields, where the soil did not appear to contain one half of the fertility of this garden, were much greater. I concluded that my garden had been so long in tillage that it was rendered unproductive on that account, and the last year I seeded the same down to grass. I shall continue this garden in grass a year or two, when I shall convert it again to tillage. I suspect that the chief cause of the infertility of this garden is owing to an excess of vegetable matter in the soil, or as the writer aforesaid would have it, there is too much of the matter of decayed leaves of trees brought on by this brook. Now shall I seek the proper remedy? Lime undoubtedly is the very thing wanted in this case. When I break up this garden again I shall sow upon the same a liberal portion of good lime.

When the communication of the writer aforesaid appeared, the editor of the 'N. E. Farmer,' recommended to him the use of lime mixed with the leaves in the form of compost. Some kinds of mud will make a most excellent manure without being mixed with lime; but I think that farmers who practice hauling large quantities of muck from swamps and other places, where the materials are composed wholly or in part, of the remains of decayed leaves of trees, &c., should mix lime in abundance with the same previous to applying it to the soil. Lime will correct all ill-effects on land that may have been injured by an application of this kind of manure. R.

Rumford, *May*, 1839.

CHINCH-BUG.

For the Farmers' Register.

Surry, *July* 10*th*, 1839.

* * * * * * * *

The chinch-bug is on every farm that I have seen or heard from in the county. It is quite amusing to hear of the remedies used to destroy them; some tar their corn, others oil it, others again try to scald them to death with hot water. It is quite unnecessary to state that none of the remedies do the least good. This year on farms where they have just made their *debut* the corn crop will be cut short at least a fourth, and for the next year I believe many would be willing to compromise and take half a crop. You have no idea what an awful sensation they have produced among the farmers; very many are frightened almost unto death, imagining that a famine with all its horrible consequences is almost at their threshold. From their immense prolificity they will be enabled to do great damage. * * * * *

MONTHLY COMMERCIAL REPORT.

For the Farmers' Register.

The news from England to the 6th of this month is very unfavorable. The pressure for money was great, and the exchanges between England and the continent were so much against the former, as to continue the drain of specie which had existed for some months previously, and embarrassed all commercial operations. The demand for British manufactures was inadequate to meet the sums required to pay for grain and other commodities imported, and the deficiency had to be made up in gold and silver. The price of wheat had, however, declined so much on an average as to increase the duty on flour from one shilling to eight shillings per barrel; the prospects of the growing crops were favorable, and therefore, a reflux of specie may ere long be anticipated. Meanwhile, however, much commercial distress is to be apprehended. The imports of cotton into the kingdom were 717,000 bales against 973,000 to same date in 1838; but such had been the diminished consumption, that only 432,000 bales had been required against 626,000 in the first six months of the respective years; and at that rate, the stock on hand was more than sufficient to supply the demand for the remainder of the present year. So great a change was not anticipated, and heavy losses are like to be the result.

It is pretty well ascertained that the receipts in the various markets of the U. States in 1839 will be about 1,350,000 against 1,800,000 bales in 1838; but notwithstanding this great deficiency, prices cannot be supported, and indeed the demand has entirely ceased, except for domestic consumption. The nominal prices are 12½ to 14½ cents.

The appearance of the growing crop is favorable in almost every portion of the country where it is cultivated.

The prices of wheat and flour have been gradually declining for some months past. The recent sales of flour have been at $5 50, and the stock of old which remains in the interior (say in the western states) is larger than usual at this season. In every part of the country, except the middle region of Virginia and North Carolina, the harvest is said to be the most abundant. Some weeks ago a few crops were sold, deliverable in this month, at $1 35, but recent contracts have been at lower rates; ranging down to 105 or 110 cents, for delivery some three or four weeks hence. That which is now brought to market for sale, commands 110 to 115 cents, if good; but there is much inferior in the crop. Unless some new and extensive demand arises, prices will be low throughout the year. The crop of oats is very abundant, and the prospects for corn were never more favorable.

Tobacco of good quality has maintained its price, while inferior descriptions have declined; the range of sales is from $4 50 to $18 50; generally $6 50 to $13 50. The inspections in Virginia will be about 27,000 hhds. against 45,000 last season, and the deficiency in other states will be in as great a proportion. The quantity manufactured at home, is also much diminished. The growing crop in all parts of the country is very promising, and will no doubt prove abundant.

Internal exchanges continue much deranged, particularly between the western and Atlantic states, with a prospect of getting worse.

Exchange on England 10 per cent. premium.

X.

July 25, 1839.

SEASON AND CROPS.

Notwithstanding the partial but yet very destructive depredations of the Hessian fly and chinch-bug on the wheat crops of eastern Virginia—the still continued ravages of the latter insect, removed to the crops of corn—the unusual operation of a severe spring drought—and the recent drought which is beginning to operate *injuriously*—and though all farmers have suffered more or less, and some greatly, from one or more of these inflictions—still, on the whole, there has never been known a year of more genial and bounteous seasons, nor one when the general prospect for all the different crops was so good. In lower Virginia, rain has at no time been so long withheld as to cause lasting injury to the growing crops—nor has any material harm been done by the unusual frequency and abundance of rain. Drought recently and generally prevailed, and threatened a disastrous change to the before luxuriant growth of corn; but the danger has been partially averted by a most bountiful rain which fell on the 24th, though it was of very limited extent; and, as is usually the consequence, they whose crops received no sufficient share of that blessing, (and we are among the number,) may hope for their turn in the course of a few days. The general distribution of a good rain now, or very soon, will secure very good average crops of corn and tobacco throughout eastern Virginia.

July 26th 1839.

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ASHINGTON COLLEGE,

IN

LEXINGTON, VIRGINIA.

next session in this institution will commence
first day of September, 1839, and continue un-
last Thursday in June 1840; a term of ten

The Faculty consist of;

ry Ruffner, D. D., President, and Professor of
and Rhetoric.
ge E. Dabney, A. M., Professor of Ancient
uages, and Literature.
Calhoun, A. M., Cincinnati Professor of
matics.
ge D. Armstrong, A. M., Robinson Professor
sical Science.
cis H. Smith, Cincinnati Professor of Milita-
ence.*
———— ————, *Professor of Modern Lan-*
and Literature.
b Fuller, A. B., Superintendent of the Prepar.
School.

regular course of study, which it is necessary
student shall have completed to obtain the de-
Bachelor of Arts, is as follows.
ssical Department. Tacitus' History, Pliny's Se-
pistles, Livy, Cicero De Officiis, De Senectute, De
itia, Horace's Odes, Satires and Epistles, Select
es of Juvenal, Terence and Persius, Xenophon's
basis and Memorabilia, Homer's Iliad, Herodo-
Demosthenes, Sophocles' Œdipus Tyrannus and
les' Medea.
thematical Department. Algebra, Plane and
Geometry, Plane and Spherical Trigonometry,
their applications to the Mensuration of Heights
Distances, Land Surveying, Navigation, Spherical
ctions, Dialling, Nautical Astronomy, Trigonome-
l Surveying and Levelling, Analytical Geome-
d Conic Sections.
partment of Physical Science. Chemistry, Elec-
, Magnetism, Heat, Mechanics, Hydrostatics,
matics, Optics, Astronomy, Lectures on Botany,
ralogy and Geology.
torical and Ethical Department. Philosophical
mar, Logic, Rhetoric, History, Mental Philoso-
Moral and Political Philosophy, Constitution of
United States, Law of Nations and Political Econ-
. Besides the subjects above specified, the Pro-
in this department is to lecture on Sunday
ings, to all the students, on Natural Theology and
Evidences of *Christianity.*
sides the above course of study, the board of trus-
at a late meeting, determined to establish the fol-
ng course, intended to meet the peculiar wants of
ers:
athematics. Algebra (through quadratic equa-
) Plane Geometry, Plane Trigonometry, Mensu-
n of Heights and Distances, and Land Surveying.
istorical and Ethical studies. Philosophical Gram-
(with special reference to the English language)
c, Rhetoric, History and Composition; Mental,
l, and Political Philosophy, with the Federal Con-
tion, and Political Economy.
ysical Sciences. General Chemistry, Natural Phi-
phy, (including Mechanics, Hydrostatics, &c.,)
ny, including Vegetable Physiology, Mineralogy,
ogy, and Agricultural Chemistry.
udents who shall have completed this course, and
a satisfactory examination on all the studies em-
ed in it, shall be entitled to an official certificate
at effect, with the college *seal annexed.*
ill of expenses in the College. Treasurer's bill,
session; tuition 30 dollars, room-rent 4 dollars, de-
ts 6 dollars. Total 40 dollars.
oard 7½ to 9 dollars per month; washing 10 dollars per session of 10 months, fuel and candles about 12 dollars; bed 4 to 6 dollars. Total per session, about 150 dollars.

The college is situated in one of the most beautiful and healthy parts of Virginia; and no effort will be spared, on the part of the faculty, which may be necessary to enable the student to acquire a complete and thorough education.

Lexington, Va., June 28th 1839.—a2t

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* In the Virginia Military Institute connected with
College.

NO-BONE

BREED OF HOGS.

For sale, full blood pigs of this breed which is so valuable for readiness in fatten, on clover grazing, or in the stye. Price $5 each. Inquire, (post-paid,) of the editor of the Farmers' Register.

May 31.—tf

DURHAM CATTLE.

Not wishing to breed "in-and-in" any longer, I offer for sale, (or exchange for another of equal value,) my imported Durham bull. I have also for sale, some of his calves. For particulars, see Mr. Berry's certificate below—also his letter in Vol. V., Farmers' Register, page 283.

Address— EDWIN G. BOOTH.
Black's and White's, Nottoway, Va.

CERTIFICATE.

Roan bull calf, sold to Mr. Edwin G. Booth calved March 12th, 1834; got by Minstrel, (bred by me) out of Peachblossom (also bred by me) by Mr. Whitaker's Triumph, (1520 Herd Book,) g. dam Rose,* by Arthur, (701) *gr. g.* dam, by Mr. Allison's bull, *gr. gr. g.* dam Mr. Hutchinson's of Eggleston's Favorite, and thence from the stocks of Messrs. T. Collings and Charge.

Minstrel, above named is by Martin, dam Musia by Weston, (452) g. dam Minerva, by Harold, (281) gr. g. dam Mary, by Meteor, (232) gr. gr. g. dam Magdelana, by Comet. Magdelana gave sixteen quarts of milk twice a day, and Harold was sold at a year old in R. Collings' sale, for £200, and *Meteor* by private treaty for £250.

Musia is dam of the Rev. H. Berry's cow, whose portrait is given in the history of work-horses, published in the Farmers' Series, by the Society for Promoting Useful Knowledge.

HENRY BERRY.

Liverpool, December 20, 1834.

P. S.—Martin, by Belzoni, (708) out of Rosanne.†

Belzoni, by North Star, (456) dam Cleopatra, sold in R. Collings' sale, a calf, for 121 guineas.

H. B.

July 27—2t.

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* Rose won the sweepstakes at Lancaster, in 1818, beating three others, and in 1819, she won the cup. She and her daughter Peachblossom, were extraordinary milkers. A son of Peachblossom, as well as herself, and twin heifers of hers, received the medal of the Liverpool Agricultural Society; and being within the limits of the society, they could not be entered for the Premiums.

† Rosanne, by North Star, (459) dam Surprise, by Major, (398) g. dam Red Rose, by Yarboro' (709) gr. g. dam American Cow, (own sister to R. Collings' Red Rose,) by Favorite, gr. gr. g. dam by Punch, 531 Foljambe, 263 Hubback, James M. Owens' Red Bull, 97.

LAND WANTED.

A person who intends to commence mulberry and silk-culture extensively, in connexion with the more usual farming operations on a small scale, with these views, wishes to buy a tract of land of from 300 to 1000 acres. The *indispensable* requisites are, that the situation shall be in the marl region—is healthy, and has good water—and is provided with sufficient and suitable buildings for the comfortable residence of a family, and for farming operations—and that the soil, or a good proportion of it, be of sandy loam, or moderately light. It is also *desirable* that the tract should be on or near James river, and would be preferred if on the southern side.

Any person desirous of selling such a tract of land, upon fair terms, for cash, or for short payments, will please write to the *Editor of the Farmers' Register*, Petersburg, (post-paid,) and give a general description of the land offered, and state the lowest price at which it will be sold.

July 29—tf

THE MOST PRUDENT
AND
Advisable Course.

In as much as there are many very indifferent Piano-Fortes bought and sold by individuals for the want of proper information in such matters, (and that information is absolutely necessary, there is not the slightest doubt, there being an essential difference in the manufacture of Piano-Fortes, well known to sensible and candid musicians,) would it not be the most prudent and advisable course for persons in want of such articles to send their orders to a seller, who keeps such Pianos as have borne the test in upwards of one hundred and twenty instances, where they have been bought and tried by individuals well known for their candor and particularity, a large number of whom have volunteered their favorable opinions; particularly too where the Pianos are sold upon the condition, that if they are not what they are represented to be, they will be taken back or exchanged. The purchaser here has every advantage of *gain*, and nothing to *lose*. When are received orders for Pianos, and the selection is left to myself, I invariably get the assistance of our Music Teacher, before deciding as to which instrument I will send. $300, $350 and $375 will purchase superb Pianos.

E. P. NASH, *Petersburg.*

June 30—tf

THE MARYLAND
SILK COMPANY,
OF BALTIMORE,

Offer for sale
50,000 Morus Multicaulis, or Chinese Mulberry Trees.
10,000 Alpine Mulberry Trees, selected with care.
5,000 Canton do. do.
5,000 Rose of Lombardy do.
10,000 Other varieties. Apply to

LUTHER J. COX, Pres't.
March 31—atf Commerce street, Baltimore.

VIRGINIA SILK AGEN

The subscriber
forms those engaged in
that he has opened an
the store of Messrs. J
Radcliffe, & Co., Main
the purpose of attend
silk business in all its
branches, viz: will p
dispose of for account of
ers, cocoons and silk in all stages, as
can possibly be fixed; and now offers
Mammoth white, grey, and yellow,
white, and six weeks yellow ball silk

ALSO,

Morus multicaulis, in any quantity,
ing in various sections of the state, deliv
1st November next, in lots to suit pur
best security will be given for every
same required.

All communications must be post paid.

J. H. D. LOWNE
Richmond,
Agent for the p

References.—Dunlop, Moncure, & Co., L
ter, Denby, & Co., Richmond, Va.

April 30—R&Atf

STEWARD, OR OVERSE

The subscriber wishes to obtain a
the ensuing year, as steward, or
large farm, or landed property. He
a location in some healthy part of the
tern states, if a sufficient inducement
for his removal. For his knowledge
ture, of accounts, and of such other
belongs to any such situation as he
the subscriber refers to Edmund Ruffin
Va., Editor of the Farmers' Register
mund Ruffin, Jr. in whose employ
has been, on their Coggin's Point
last four years. ANDREW

Coggins' Point, June 15, 18

TO PLANTERS,
On and near the Ap

FORWARDING BY TH
Richmond and Peters
RAIL-ROAD.

Produce sent down the Appomattox
directed, be forwarded by this Rail Road
mond. The Depot Agent at Pocahontas
Squires,) will attend to the forwarding
Basin in Petersburg, and pay the dra
Company will not be liable for accidents
except as at present, on its own road.
ing commission of 10 per cent. on the
this road will be charged by the Agent,
ceived with the freight and drayage.

Produce sent to be forwarded, should be
panied by a letter from the owner to the Ag
be delivered by the boatman at the Depot
cahontas immediately on his arrival.

☞ Freight on tobacco $1 per hogshead
wheat 6 cents a bushel.

Richmond, June 30, 1839.—R&Atf

H. Nutt Esq

THE

FARMERS' REGISTER,

A MONTHLY PUBLICATION,

Devoted to the Improvement of the Practice

AND

SUPPORT OF THE INTERESTS OF AGRICULTURE.

EDMUND RUFFIN, EDITOR AND PROPRIETOR.

Vol. VII. AUGUST 31, 1839. No. 8.

And he gave it for his opinion, "that whoever could make two ears of corn, or two blades of grass, to grow upon a spot of ground where only one grew before, would deserve better of mankind, and do more essential service to his country, than the whole race of politicians put together." *Swift.*

PETERSBURG, VA.

PUBLISHED BY THE PROPRIETOR,

1839.

[This publication consists of four sheets—postage for 100 miles or less, 5 cents—over 100 miles 10 cents.]

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EDMUND RUFFIN, Jr.

August 31—a&wif

THE FARMERS' REGISTER.

VOL. VII. AUGUST 31, 1839. No. 8.

EDMUND RUFFIN, EDITOR AND PROPRIETOR.

RAIL-ROADS IN THE KINGDOM OF BELGIUM COMPARED WITH THOSE IN THE UNITED STATES.

By the CHEVALIER DE GERSTNER.

The rapid increase of internal improvements in the United States has excited for several years public attention in Europe, and the friends of those improvements desired very much a detailed report on the extent and progress of those works, and particularly of *rail-roads*. There is no such report published in the United States, and even those published in England, France, and Germany, are very imperfect.

In 1824 I had charge of the first rail-road on the continent of Europe to connect the rivers Moldau and Danube in Austria, by a line which is 130 miles long, and since 1832 in operation. I constructed in 1836 and 1837 the first rail-road in Russia, from St. Petersburg to Zarskoe-Selo and Pawlowsk, a line of only 17 miles in length, but the commencement of a rail-road of 420 miles from St. Petersburg to Moscow. This rail-road being likewise in full operation, I left Europe last fall, and arrived in the Great Western on the 15th of November 1838, at New York. After a short stay of a few days, I went to Albany and inspected all rail-roads between that place and Lake Erie; I then proceeded to the eastern states and visited all rail-roads in Massachusetts, and went *via* New York, Philadelphia, Baltimore, Washington, through Virginia, North and South Carolina, Georgia, and Alabama, to New Orleans, always visiting the rail-road lines in the different states. I went then up the Mississippi and Ohio, and am now inspecting the internal improvements of the western states and some of those in Pennsylvania, which I have not yet seen.

I have already passed over more than 2000 miles of rail-roads, and have every where been received with the greatest kindness; the presidents, directors and engineers of the different rail-road lines gave me not only all their printed reports, but laid before me, with the greatest liberality, their books and accounts, in order to give me every kind of information. I fulfil only my duty when I publickly acknowledge that such a liberality is only to be found amongst a free and enlightened people, where all public works are based on the principle of publicity, and where secrets do not exist. I wish, therefore, to make those gentlemen, to whom I am so much indebted, another communication, which will show at the same time what has been done during the last years in Europe. Having within a few days received the last reports of the Belgian rail-roads, I publish in the following abstract the history and progress of those communications in Belgium, together with a comparison of them with the American rail-roads.

According to the facts collected during my travels since my arrival in New York, there are now *over three thousand miles of rail-roads completed and in operation in the United States;* 425 locomotives, of which the greatest number were made in this country, run on the several rail-roads; and I believe, that up to the end of 1839, the length of rail-roads in the United States may amount to 4100 miles. The capital expended on the rail-roads now in operation is about sixty millions of dollars, or at an average cost of twenty thousand dollars per mile, for which sum the rail-roads, with the buildings, have been constructed, and the necessary locomotives and cars bought.

Several rail-roads have been undertaken with insufficient means, and the shareholders found themselves under the necessity of employing the income of the first years in improving the rail-road, in building engine-houses, &c. and purchasing locomotives and cars. In consequence of this, the shareholders got during that time no dividends, but the rail-road still yielded a good income. Other rail-roads, when finished, paid from five to ten per cent. income to the stockholders; others have not yet paid any dividends for want of a sufficient number of passengers and freight. The *average result* of the rail-roads now in operation in the United States is, *that they give a yearly interest of five and a half per cent. on the capital invested.* This result must be regarded as very satisfactory, because the greatest part of the lines have only been a few years in operation.

On all lines there is a yearly increase of at least 15 to 20 per cent. in the gross income, so that even those lines which do not pay now, will give, in a few years, a handsome dividend. According to these statements, based on the communications collected in this country, I have no doubt, that the large capital invested in rail-roads, in the United States, will not only produce an incalculable benefit to the country, but likewise pay the shareholders a dividend, which under good management, by the constant progress in poulation and trade, must likewise from year to year increase.

A good book-keeping, and clear accounts, is in every business a matter of importance; rail-roads are new constructions, and experience, particularly in working them, is still very much wanted. When the superintendent of a rail-road in operation keeps clear and distinct accounts, he will in a few years learn by experience what can be improved, and which items of expenses can be reduced. The following statement contains a manner of making the rail-road accounts, which in my opinion must prove very useful for every rail-road company.

I. *History, length and cost of construction of the Belgian rail-roads.*

The rail-roads, which up to the present time have been constructed in England and on the continent of Europe, had no other object than to connect two important places of the country, and in constructing them, therefore, only a local interest more or less prevailed. That rail-roads are to be considered *as great thoroughfares*, that they can form in a country the principal lines of internal communication—that, therefore, the means for their establishment should be such, as only can be raised by a whole nation, nobody in Europe would maintain previous to the year 1834, and is even now denied by many individuals of high standing and influence. Belgium, united with Holland since 1815, had distinguished itself in Europe, by its fine roads, and magnificent canals; the latter, being constructed for the greatest part in a level country, and without locks, were used not only for the transportation of goods, but also for passengers, especially the lower classes, which there, more than in any other country, made use of the canal boats for their travels. It is evident, that no individuals would ever have attempted to construct rail-roads parallel and in opposition to such canals and turnpike roads.

In the year 1830, Belgium declared itself independent of Holland, and elected by the representatives of the nation its own sovereign. **King Leopold** I. soon discovered, that the country, for its perfect tranquillity, wants "labor"; a series of wise legislation encouraged the nation to useful and profitable enterprises, and every person with talent and inclination found employment and earnings in a country, which isolated from all its neighbors, was confined to its own resources. But to gain the public opinion, a great national work was to be accomplished by the new government, able to fill posterity with admiration. The time was past for Egyptian pyramids, for Roman triumphal arches, and French monuments of war. A more useful monnment, one of peace and intelligence, should remind the nation of that eventful period. The king ordered the whole country to be surveyed by able engineers, the necessary plans and estimates formed, and on the first of May 1834, a law was proclaimed, according to which *a system of rail-roads should be introduced through the whole kingdom, and executed at the expense of the state;* on two points (at Antwerp and Ostend), the rail-roads were to lead to the seaports, on two points to connect with France, and on one point with Prussia (Germany)'

The news of the gigantic work, undertaken by a state, even not yet acknowledged as such by the northern powers, and with only four millions of inhabitants, excited the greatest surprise in Europe, and few only could conceive the great results, which this grand project must necessarily produce *on the independence of the nation and its internal welfare*, its commerce and industry; the former being the principal aim, and the promotion of commerce and industry a subordinate one, although the great mass of the people were unable to comprehend the grand idea of the plan.

King Leopold found in his former minister of public works, Mr. De Theux, and in his successor Mr. Nothomb, vigorous supporters. The engineers were vying in the swift prosecution of the work, and in the course of four years more has been done than was expected. The enligtened minister Nothomb published annual reports to the legislative assembly, besides other special reports of the progress of the works, in which the public in Europe find a rich source of experience, not to be met with in any report or work on the subject. Europe has to render thanks to the king, who the first realized such a grand idea, and to his enlightened minister, who judiciously conducted the work, and so liberally communicated its results.

The limited space of this report does not allow a detailed extract from the above mentioned reports of the minister Nothomb and the engineers; I shall therefore only give a brief account containing the results in numbers, and afterwards compare these results with those of rail-roads in the United States. The following table contains the sections of the rail-roads which were opened until the end of 1838, and their lengths in me'tres and English miles.

SECTION OF RAIL-ROAD.		*Time of opening.*	LENGTH.	
From	*To*		*In French Mètres.*	*In English miles.*
Brussels,	Malines,	5 May, 1835.	20,300,	12.6
Malines,	Antwerp,	3 May, 1836,	23,500,	14.6
Malines,	Termonde,	2 Jauuary, 1837,	26,700,	16.5
Malines,	Louvain,	10 September, 1837,	23,750,	14.7
Louvain,	Tirlemont,	22 September, 1837,	17,750,	11.0
Termonde,	Ghent,	28 September. 1837,	30,500,	18.9
Tirlemont,	Waremme,	2 April, 1838,	27,200,	16.8
Waremme,	Ans,	2 April, 1838,	18,900,	11.7
Ghent,	Bruges,	12 August, 1838,	44,500,	27.6
Bruges,	Ostend,	28 August, 1838,	23,500,	14.6
		Total,	256,600,	159.0

According to the report, made by the minister to the house of representatives, on the 26 November 1838, the above ten sections, including buildings, locomotives and cars, cost 34,000,000 francs; this gives per mile of road 41,300 dollars. The rail-road from Brussels to Antwerp, 27.2 miles, has a double track; the remainder are constructed only with a single track, the rails weighing 45 lbs. per yard. But there are several buildings yet to be erected, and different works on the line to be executed, and besides a number of freight cars to be provided for, &c.; with all this the cost per mile will amount to 45,000 dollars.

II. *Tariff for Passengers, Speed.*

There are on the Belgian rail-roads four classes of passenger cars, differing only in elegance and comfort, but going in the same train, and therefore with equal velocity. The prices are:

In the Berlines,	2⅓	cents per mile,			For each passenger with 44 lbs. of baggage.
" Diligences,	2	"	"	"	
" Chars à Bancs	1⅓	"	"	"	
" Wagons,	0.8	"	"	"	

The trains perform at an average 17 Eng. miles per hour, all stoppages included, or from 20 to 25 while running.

III. *Traffic and revenue of the Belgian Rail-roads.*

The rail-roads in Belgium are frequented by more passengers than any other rail-roads; the transportation of freight was only begun between Brussels and Antwerp, in 1838. The following table shows the travel since the opening of the first section, until the 31st of October 1838.

PERIOD.	*Total number of passengers.*	*Average distance performed by each passenger.*	*Number of passengers reduced for one mile.*	GROSS INCOME. *From all passengers.*		*per pas. per mile.*
		Miles.		Francs.	Dollars.	Amer. cts.
From 5th of May 1835 to 2d of May 1836.	563,201	11.6	6,536,754	359,394	67,429	1.08
From 3rd of May to 31st of Dec. 1836.....	729,545	20.2	14,718,709	734,736	137,849	0.90
In the year 1837......................	1,334,577	17.2	23,838,436	1,416,983	265,850	1.11
From 1st of Jan. to 31st of Oct. 1838.....	1,921,619	22.8	43,887,864	2,589,334	485,813	1.11
In 3 years 6 months..................	4,598,942	19.35	88,981,763	5,100,497	956,941	1.07

To which must be added 44,148 francs, or 8,281 dollars, as the gross income from freight in the year 1838.

In the year 1837 there were 30,857 soldiers under the number of passengers, for whom, in consequence of an arrangement with the ministry of the war department, only half price was paid.

In 1838 the total number of passengers amounted, according to the "Moniteur Belge," to 2,238,303, comprising 56,618 soldiers, and the gross income was 3,100,833 francs 40 centimes (581,770 dollars). As the average distance performed by each passenger in the first 10 months of 1838 is not mentioned in the report of the Minister, I supposed the income per passenger per mile to be the same as in 1837, out of which results an average distance of 22.8 miles. In order to show how the travelling public made use of the different classes of cars, the following contains the number of passengers in each class of cars, and the revenue resulting therefrom for the year ending 31st December 1838. During this period there were

Classes.

17,503	passengers,	I.	who paid	69,322f.	65c.
215,893	"	II.	"	702,502f.	70c.
604,935	"	III.	"	1,033,953f.	05c.
1,343,354	"	IV.	"	1,087,790f.	45c.
56,618	soldiers,		"	45,248f.	88c.
	For overweight of baggage, and freight,			162,015f.	67c.
2,238,303	passengers, and total income,			3,100,833f.	40c.

These numbers explain sufficiently that the rail-roads in Belgium are used principally, by the lower classes of the people.

IV. *Cost of working the Belgian rail-roads.*

The accounts kept under this head contain an exact subdivision of the different expenses occurring in working the rail-roads; the first general subdivision contains *the maintenance of way and police;* the second *the cost of transportation*, viz. fuel, engineers and firemen, repairs of locomotives and cars, grease for the same, also the expenses for conductors, carriers and baggage men; the third embraces *the general expenses*, viz. clerks and ticket sellers, comptrollers, printing, advertising, office expenses, &c. The annexed table contains the expenses under the different heads:

PERIOD.	*Maintenance of way and police*	*Transportation account.*	*General expenses.*	*Total.*	
	FRANCS.	FRANCS.	FRANCS.	FRANCS.	DOLLARS.
From 5th May to 31st Dec. 1835	...50,584 01..	..105,967 88..	...12,220 84...	..168,772 73..	31,665
Year 1636,...................	..132,637 41..	..261,778 30..	...36,719 96...	..481,135 67..	80,888
Year 1837,...................	..345,824 53..	..664,940 46..	..144,706 92...	1,155,471 91..	...216,786
From 1st Jan. to 31st Oct. 1838	..377,822 58..	.1,059,180 71..	..182,186 48...	1,619,189 77..	...303,788
In 3 years and six months,....	..906,868 53.. or 27 pr. ct.	2,091,867 35.. or 62 pr. ct.	..375,834 20... or 11 pr. ct.	3,374,570 08.. or 100 pr. ct.	...633,127

As this table contains the expenses of working the rail-roads 3½ years, these numbers may certainly be regarded as the result of a great experience.

V. *Cost of Repairs of Locomotives and Cars.*

In the last table the sum of 1,059,180 francs 71 centimes appears under the head of transportation account for ten months in 1838. This sum contains the expenses for foremen in the

shops. - - - - - -	32,177f. 54c.
For laborers, expenses - -	187,463f. 61c.
At the principal shops in Malines,	54.868f. 72c.
For materials for repairs,- -	87,965f. 66c.
Total,	362,475f. 53c.

or 68,006 dollars, which is 34 per cent. of the expenses of transportation. I believe that the expenses for repairs of engines and cars might be diminished by the introduction of locomotives with moveable trucks in front, and of eight-wheeled passenger and freight cars.

VI. *Expenses Per Passenger Per Mile.*

The accurate number of miles performed by passengers not being contained in the last report, the expenses per passenger per mile can only be found up to the end of 1837. According to the last statement, the expenses from the 5th. of May 1835, to the 31st. of December 1837, were :

For maintenance of way, -	529,045f. 95c.
Transportation account, - -	1,032,686f. 64c.
General expenses, - - -	193,647f. 72c.
Total,	1,755,380f. 31c.

During the same period the number of passengers reduced to 1 mile was equal to 45,093,899, which divided in the above gives as the expenses per passenger per mile,

	centimes,	or cents.
For maintenance of way, -	1.17	0.22
Transportation account, -	2.29	0.43
General expenses, - -	0.43	0.08
Total,	3.89	0.73

These expenses are very low, and are exceeded on every other rail-road.

VII. *Expenses per Mile of Travel.*

The number of miles performed by all the locomotives with their trains was:

From 5th May 1835, to 2d May 1836, - - - - - - 14,810 lieues.
From 3d May 1836, to 31st December 1836, - - - - 24,825 lieues.
From 1st January 1837, to 31st December 1837, - - - 61,592 lieues.

Total, 101,227 lieues.

at 500 me'tres, or 314, 506 English miles; the expenses during the same period of 2 years and 8 months were,

For maintenance of way, -	529,045f. 95c.	therefore per mile of travel,	1f. 68c. or 31½ cents.
For transportation account, -	1,032,686f. 64c.	" " "	3f. 28c. or 61½ cents.
General expenses, - - -	193,647f. 72c.	" " "	0f. 62c. or 12 cents.
Total,	1,755,380f. 31c.		5f. 58c. or 105 cents.

The expenses for every mile which a locomotive with its train runs, amount therefore to 5 francs 58 centimes, or 1 dollar 5 cents, being very near the same as on the American rail-roads.

VIII. *Number of Passengers per trip.*

In the table under No. 3, we have shown that the number of passengers from the 5th of May 1835, to the 31st of December 1837, reduced for the length of a single mile of road, amount to 45,093,899; during the same period the trains performed 314,506 miles; this gives 143 as the average number of passengers in a train. This number compared with 5f. 58c. as the expenses per mile of travel, gives again 3·89c. or 0.73 cents as the expense per passenger per mile.

IX. *Comparison between the gross income and the nett revenue.*

The following table contains the annual gross income, current expenses and the surplus of income over the expenses, as is related in the report of the Minister of the 26th of November 1838, to which is annexed the annual surplus for every 100 francs of the gross income.

PERIOD.	*Total gross Income.*		*Current Expenses.*		*Surplus of the revenue over the expenses.*		*From 100f. of the gross income remained after defraying all expenses.*
	FRANCS.	CENT.	FRANCS.	CENT.	FRANCS.	CENT.	
5th May 1835, to 31st Dec. 1835,.	268,997	50	168,772	73	100,224	77	37f. 26 centimes.
Year 1836,.....	825,132	85	431,135	67	393,997	18	47f. 75 centimes.
Year 1837,....................	1,416,982	94	1,155,471	91	261,511	03	18f. 46 centimes.
1st Jan. 1838, to 31st Dec. 1838,.	2,633,532	21	1,619,189	77	1,014,342	44	38f. 52 centimes.
Total,................	5,144,645	50	3,374,570	68	1,770,075	42	34f. 41 centimes.

As an average, therefore, of 3½ years, of every 100 francs revenue, only 34 francs 41 centimes remained, but as all the locomotives and cars are still new, and no amount for general depreciation appears under the expenses, it is to be supposed, that in future only 30 francs will remain from 100. This surplus serves as interest and a sinking fund for the capital.

X. *Gross income per mile of rail-road.*

The public in Europe is almost throughout of opinion, that only short lines, and these especially between two populous cities, will pay a good interest, but the branch roads extending to remote, less populated parts of a country will never yield any profits. What results the Belgian roads give in that respect, the annexed table will show:

PERIOD.	*No of sections opened.*	*Average length of road in operation*	*Gross income during the whole period.*		*Annual income per single mile of road.*		
			FRANCS.	CENT.	FRANCS.	CENT.	DOLLARS.
5th May to 31st Dec. 1835,..	1	12.6	268,997	50	32,333	75	6,066
Year 1836,..	2	22.3	852,132	85	38,212	23	7,169
Year 1837,................	6	56.1	1,416,982	94	25,258	16	473 9
1st Jan. to 31st Oct. 1838,...	10	118.7	2,683,532	21	26,638	84	4,998
Total, ...		53.1	5,144,645	50	27,735	98	5,204

In the second column appears for the year 1835, only the section between Brussels and Malines of 12.6 miles, opened at that time. In the year 1836, these 12.6 miles were in operation for 365 days, and the second section from Malines to Antwerp, of 14.6 miles, for 243 days only. In multiplying the length of each sections by the respective numbers of days, and dividing the sum by 365, we receive 22.3 miles as the average length in operation during the whole year 1836. In the same manner the average length was obtained for the years 1837 and 1838. The last column shows, that the annual receipt per single mile of road amounted in the first year, when the novelty attracted many passengers, and only 12.6 miles were opened, to 32,333 francs 75 centimes, and that in the 3d and 4th year, when curiosity attracted but few, and the greatest number travelled for business only, and while a much greater length of road was in operation, these receipts amounted still to 26,500 francs per mile yearly. This amount will undoubtedly be increased in the following years, as in 1838 four new sections came in operation, on which the traffic will develope itself only by-and-by; besides there will be the transportation of goods, which for the year 1839, is estimated to give a revenue of 850,000 francs for 159 miles, or 5346 francs per mile; the gross income on the Belgian rail-roads, will therefore also in future, like the first year, amount to about

32,000 francs per mile of road annually. That by the increase of population and commerce, also this income of 32,000 francs will be increased, is evident; the rail-roads in Belgium serve therefore as a proof, that long lines of rail-roads may (some extraordinary circumstances excepted,) be executed with equal success as short ones.

It would be quite erroneous in calculating the revenue of a system of rail-roads, canals, or turnpike roads, to regard the income on the principal line separately, and so the revenue of each of the branch lines, in order to judge of the value of each of them. By the opening of a branch line, the income of the main line must become greater; because the passengers and freight from the branch lines will pass over the same and increase the revenue. The accurate way of culculating a whole system of rail-roads, canals or turnpike roads, must therefore be to compare the *total income of the main line as well as of the branch lines*, with the *total length of all the lines*, in order to find the *average income per mile*; and in deducting therefrom the expenses, the balance will show, when compared with the cost of construction per mile, what interest enures for the capital invested.

XI. *Budget for the operations of the Belgian rail-roads in the year* 1839.

We have seen that the annual gross income will amount to 32,000 francs per mile, therefore for the 159 miles, which are in operation, to 5,088,000 francs. After defraying all the expenses from 100 francs gross receipts there remain 34 francs 41 centimes, the net income will, therefore, be 1,650, 780 francs, instead of which the minister in his budget anticipates the amount at 1,700,000, to which he is led by a different calculation. This surplus is exactly 5 per cent. of the capital expended of 34,000,000 francs. These 5 per cent. suffice for interest and sinking fund, and therefore the Belgian rail-roads fulfil their object, to maintain themselves without being a charge to the state treasury.

XII. *Increase of income from the mail and turnpikes.*

As an objection against rail-roads it was further maintained, that their introduction in a country will lessen considerably the receipts of tolls on turnpike roads and of the mail, because there will be less travel on turnpike roads, and letters will be carried by persons who travel on rail-roads; the same opinion appears to have existed in Belgium. On the 27th of January 1838, the minister, Mr. Nothomb, declared in the senate, that the revenue of the mail in 1837, exceeded that of 1836 by 262,373 francs, and the tolls on turnpike roads by 110,000 francs, for the reason that although the tolls on those roads which go in a parallel direction with rail-roads are lessened, yet they are increased in a greater proportion on those turnpike roads which lead to the rail-roads, as they are passed over by all who come to travel on the latter. The revenue from the mail increased in consequence of the greater intercourse occasioned by the introduction of rail-roads.

XIII. *Comparison of the Belgian Rail-Roads with those in the United States.*

According to table under No. 3, the number of passengers during 3½ years, reduced for the length of one mile, amounted, on the Belgian rail-roads to 88,981,763, or at an average per year of 25,423,361. As the average length of road in operation during the whole time was 53.1 miles, we have 478,783 through passengers annually. The *Belgian rail-roads are therefore travelled over on their whole length by nearly* 500,000 *passengers per year.* We have now the following comparison:

(*a*) *Cost of construction.*—A mile of rail-road with a single track, and the necessary building and outfit, costs in America 20,000 dollars; in Belgium 41,300 dollars, or more than twice the amount.

(*b.*) *Tariff.*—On the American rail-roads, a passenger pays at an average 5 cents per mile; on the Belgian rail-roads, only 1 cent, or five times less; for freight, the charge is, in America, at an average 7½ cents per ton per mile.

(*c.*) *Speed.*—On the American rail-roads, passengers are conveyed with a speed of from 12 to 15 miles per hour, stoppages included; on the Belgian roads at the rate of 17 miles; or stoppages not included, at the rate of from 20 to 25 miles.

(*d.*) There are at an average, 35,000 through passengers, and 15,000 tons of goods carried annually over the American roads; on the Belgian there have been carried per year 478,783 through passengers, and the trasportation of goods only commenced a short time since.

(*e.*) *Gross income.*—The same amounts on the American rail-roads, at an average per mile and per year,

From 35,000 passengers at 5 cents, -	$1750
From 15,000 tons of goods at 7½ cents,	1125
From mail and contingencies, - -	200
Total,	$3075

On the Belgian rail-roads the gross income per mile from 478,783 passengers, and the trasportation of freight amounts to 32,000 francs or 6003 dollars 75 cents per year.

(*f.*) *Expenses per mile of travel.*—These amount on the American rail-roads to 1 dollar, on the Belgian roads to 1 dollar 5 cents, or they are the same in both countries.

(*g.*) *Number of passengers per trip.*—In Belgium there were in each train, at an average of 3½ years, 143 through passengers; on the American roads, a passenger train contains only 40 through passengers, at an average.

(*h.*) *Number of trips per year.*—In dividing 35,000 by 40 we obtain 875, as the average number of passenger trips per year on the American rail-roads; and in dividing 478,783 by 143 we get 3348, which represents the average number of passenger trains passing annually over the Belgian roads. As at the same time the speed on the latter is greater than on the American rail-roads, it was necessary to employ rails of 45 lbs. per yard while their weight is generally less on the American rail-roads,

(*i.*) *Expenses per passenger per mile.*—These are in Belgium only 0,73 cents, and in America 2½ cents, or 3½ times more. The reason of it is, that the American trains contain 3½ times less passengers, while the expenses per train per mile are equal in both countries. It is very nearly the same for a locomotive to carry 40 or 143 passengers in a train.

(*k.*) *Annual current expenses.*—In America the annual current expenses for working a rail-road, are per mile,

For transportation of 35,000 passengers, at 2½ cents, - - - -	875 dollars.
For transportation of 15,000 tons of goods at 6½ cents, - - - -	975 dollars.
For transportation of the mail and other expenses. - - - -	100 dollars.
Total,	1950 dollars.

Or 63 dollars 41 cents of every 100 dollars gross income. On the Belgian rail-roads, of every 100 dollars gross revenue, the expenses are 65 dollars 59 cents, or per year per mile 3937 dollars 86 cents.

(l) Interest on the capital invested.—In America the annual average gross income, per mile, of road, amounts to 3075 dollars, the annual current expenses to 1950, leaving 1125 dollars, which compared with the cost of a mile of road (20,000 dollars), give 5½ per cent, interest. On the rail-roads in Belgium, the annual gross income, per mile, is 6003 dollars 75 cents, the expenses 3937 dollars 86 cents, leaving 2065 dollars 89 cents as interest on the cost of 41,300 dollars per mile, or exactly 5 per cent.

XIV. *General remarks.*

The comparison of the results of the Belgian rail-roads with those of the rail-roads in the United States of America, speaks evidently in favor of the first. The extremely low charges for passage on the Belgian rail-roads has increased the number of passengers in an unparalleled degree, and produced an intercourse not attained in any other country of the world. While the higher prices in the better classes of cars yield a considerable profit, the price in the last class or for the great mass of the people, is so low that it almost only covers the expenses. The Belgian rail-roads are, therefore, throughout a great popular, democratic establishment, which must have found the approbation of the people and every intelligent man; the Belgian rail-roads afford to the government the greatest facility in the tranportation of troops, the importance of which was evinced principally for the last years; the Belgian rail-roads yield, in conformity with the grand idea of their establishment, only the interest and sinking fund of their capital, but the state treasury has, by the increase of intercourse, indirectly gained in all taxes, in the revenue from tolls on turnpike roads and from the mails; the most important gain, however, was that kept in view by the great founder of these roads, to bring the nation into a more intimate contact, and to form of it one large family, on which the actual national device, "L'Union fait la force," ("Union gives strength,") becomes realized.

F. A. Chevalier De Gerstner.

Cincinnati, 25th June, 1839.

☞Five francs and 33 centimes, or 533 French centimes are equal to one dollar. One English mile is equal to 1610 metres.

THE COTTON CROPS OF THE WORLD.

From the Philadelphia Inquirer.

There is no subject connected with commerce or agriculture, which possesses a higher interest for the citizens of the United States, than the production and consumption of cotton. We have, on more than one occasion, devoted our columns to the insertion of information upon the subject; and our attention is particularly called to it just now, in consequence of a recent publication of a valuable letter, signed "Cotton Plant," in a spirited New York paper, called the 'Whip.' The writer commences by stating that the entire growth of cotton in the world is set down at $1,000,000,000 pounds. Of this, 550 millions are supposed to be grown in the United States; 30 in Brazil; 8 in the West Indies; 27 in Egypt; 36 in the west of Africa; 190 in the west of Asia; 35 in Mexico and South America, except Brazil; and 14 millions elsewhere.

Thus, at 10 cents per pound, a price below which it has rarely ever fallen, this crop is worth $100,000,000. For the last fifty years, however, the value (though often fluctuating suddenly and widely) has averaged 19 1-2. At this price, the present growth of the world is worth $192,500,000.

Of this, about 350 millions of pounds are consumed and manufactured in England; about 150 millions in the United States; 80 in France; 250 in China and India; 25 in South America and Mexico, including Brazil; 35 in Germany; 45 in Turkey and Africa; 10 in Spain; 20 in Russia; and the remainder elsewhere.

The value of cotton manufactures in England is believed to be annually about 170 millions of dollars; in France at 70 millions; in the United States at 60 millions.

The capital employed in manufacturing by machinery, is estimated in England at 200 millions of dollars; in France at 120 millions; in the U. States at 110 millions.

The consumption in manufactures of raw cotton in all Europe, in 1803, was estimated at only 60 millions of pounds. (Dic. of Span. Com.) The whole consumption in Europe, in 1830, was about 387 millions of pounds. In 1838, it is believed to be nearly 500 millions of pounds.

South Carolina and Georgia were the first states in this Union to grow cotton to any considerable extent. In 1791, two millions of pounds were grown in the union—one and a half millions of which grew in South Carolina, and one half million in Georgia.

In 1801, forty millions was the crop of the United States—of which, 20 millions grew in South Carolina, 10 in Georgia, 5 in Virginia, 4 in North Carolina, and 1 in Tennessee.

In 1811, the crop of the United States had reached 80,000,000—of which, 40 grew in South Carolina, 20 in Georgia, 8 in Virginia, 7 in North Carolina, 3 in Tennessee, and 2 in Louisiana.

In 1821, one hundred and seventy millions of pounds were growing in the union, as follows: 50 millions in South Carolina, 45 in Georgia, 20 in Tennessee, 20 in Alabama, 12 in Virginia, 10 in North Carolina, 10 in Louisiana, and 10 in Mississippi.

In 1828, the whole crop of the union was 348½ millions. Of this, Georgia grew 75 millions, South Carolina 70, Tennessee 45, Alabama 45, Louisiana 38, Mississippi 20, Virginia 25, North Carolina 18, Florida 2, and Arkansas one-half of a million.

In 1833, the crop of the union had increased to 437¾ millions. Of this, 88 millions grew in Georgia, 73 in South Carolina, 70 in Mississippi, 65 in

Alabama, 55 in Louisiana, 60 in Tennessee, 15 in Florida, 13 in Virginia, 10 in North Carolina, and three-fourths of a million in Arkansas.

The next year (1834) the crop had increased to 457 1-2 millions, and was grown as follows; 85 in Mississippi, 85 in Alabama, 75 in Georgia, 65 1-2 in South Carolina, 62 in Louisiana, 45 in Tennessee, 20 in Florida, 18 in Virginia, 9 1-2 in North Carolina, and in Arkansas one-half a million. Subsequently, no certain data are in our possession; but the estimate at this time, is 550 millions as the whole crop of the Uuion.

Thus it will be seen, from 1791 to 1826, South Carolina was the most abundant cotton growing state in the union. In 1826, Georgia took the lead, and held it till 1834, when Alabama and Mississippi took the front rank. At this time, Mississippi is perhaps the most extensive cotton growing state in the union. South Carolina and Alabama are next. North Alabama is begining to deteriorate as a cotton country, while the worn lands in middle Tennessee are thought to improve for this culture—maturity, the vital desideratum, not being so easily allowed in the rank luxuriance of the fresher soils.

When it is remembered that the *first cotton plant in the United States* were raised in 1787, surely our readers will find reason for surprise at the wonderful increase that has accrued in little more than fifty years! Bold, indeed, must be the man who would venture to predict the wealth, greatness, and power, likely to become our national attributes through the agency of cotton.

NEGLECT OF AGRICULTURE IN GUILFIELD, N. C. RECENT DISCOVERY OF LIME.

Guilfield, N. C., Dec. 28th, 1838.

* * * * * * * *

We have great need of information on agricultural subjects in this part of the country. The county of Guilford has a population of 20,000 souls, and I do not know of but two other gentlemen in the county, besides myself, who take an agricultural newspaper. There may be others of whom I do not know, but it is certain, the number is but small. This county in regard to original fertility, has been one of the finest in the western part of the state. The county lies on the head branches of the Cape Fear, one large branch of which, the Haw, runs across it on the north side, and Deep River on the south, which together with the numerous tributary streams emptying into them, have afforded in times past large bodies of beautiful lands for cultivation; but the hand of man has been too successful in its destruction. Here we have no judicious rotation of crops; but one year in corn and the next in small grain; and this in continual succession has been, with few exceptions, the general system of cultivation. But little attention has been bestowed on making manures, and no matter what may be the demand and the need for that commodity, the supply usually consists of what is made in the stables in a natural way, perhaps even without a necessary supply of litter.

Lime has heretofore been beyond our reach and beyond our hopes. But from the accidental burning of the soil of a neighboring county (Stokes) in the course of the last year, we now entertain the belief that it may ultimately be furnished in such quantities and for such prices as will justify its application as a manure for lands. The soil was underlaid with a species of rock that no person had ever dreamt of being lime-stone; but the first rain that fell after the fire, the rock slacked and furnished a quantity of fine lime. The quarries from which the rock were obtained are about thirty miles west of this place, and are said to be inexhaustible.

I think I can perceive the commencement of a better and more enlightened system of agriculture than we have heretofore had. Improvements have already begun, and I have no doubt will be successfully carried on. There seems to be a desire for agricultural information pervading the country, which I hope will be the means of causing the people to procure and read agricultural papers. Industry is not wanting. And I have no doubt when knowledge and information are added to the industry which our people possess, that it will be the means of making our country, what it ought to be, prosperous, wealthy and happy.

[The foregoing extract was marked for publication, at the time when receceived, but by accident the letter containing it was mislaid, and was not recovered until now.—Ed.]

HUSSEY'S REAPING MACHINE. ILL EFFECTS TO DESERVING INVENTORS OF THE PUFFING SYSTEM.

As far back as in our second volume (at page 593,) we published an account of the operation of Hussey's reaping machine, which then was receiving favorable notice in the papers of the day. But, like nineteen-twentieths of what are called agricultural improvements, after so much early eulogium, it seemed to pass into oblivion, and we heard nothing more of it for some years, and naturally inferred that it was like so many other novelties (or supposed novelties) which are continually sent forth, under a cloud of bought and begged and false commendation, and which after effecting as much as possible their object, to deceive for gain; had sunk into merited contempt. But this machine has recently been again brought to public notice, and in such manner as to induce the belief that it is likely to be a very valuable agricultural improvement. In addition to several newspaper articles, one of which will be copied below, we have the following statement, in a short postscript to a private letter from S. Hambleton, esq., of Talbot, Md., from whom we shall be pleased to receive a much more full and particular account, for our next number.

"I am running, with much satisfaction, Hussey's wheat reaper. It works well and with expedition. Two horses, one driver and a raker attend it. It keeps eight binders pretty well employed."

The following notice is from the American Farmer.

"We learn from the Bugle at Chestertown, that this machine was put in operation on the farm of Judge Chambers near that place, and that it far surpassed the expectations of all who witnessed it. Judge Chambers has about 150 acres in wheat and rye, and the manner in which the fields so far have been cut down is much superior to the ordinary mode of cradling, scarcely a straw being left standing. The machine keeps 6 binders hard at work, even with the stoppages that are incidentally required; we suppose it could give employment to several more, without increasing the speed, which, says the editor, when we saw it, was a brisk walk, three mules being hitched to it. This machine we understand is warranted to cut 15 acres per day; at that rate, it is more than equal to six cradlers. Another thing which attracted notice was the great regularity with which the straw and grain were laid for the binders, no raking with careful binders being required. Every person who has seen this machine in operation has been highly gratified with its performance—among others, Judge T. B. Dorsey of Anne Arundel and John Glenn, Esq. of Baltimore, who came over last week in the steam-boat Walcott for the express purpose of witnessing its operation. It is as much superior in the quantity and quality of its work to the cradle, as the latter is to the old fashioned reaping hook, and it answers equally well in light grain or rank.

The American says—"The patent reaping machine of Mr. Hussey has been used in various parts of Maryland during the recent harvest, and has been very generally and highly approved, as well on account of the perfect and expeditious manner in which it operates, as the saving of labor effected by it. Opinions are various as to the amount of work which it performs in a day, some estimating it as equivalent to six, and others to ten cradles. The cost of the machine is $150."

If this machine should prove to be, as we earnestly hope it may, a very important benefit to agriculture, the facts of its early and general commendation, and afterwards, its long neglect, and now its resuscitation and testing by fair and proper trial, all go to show the great injury inflicted on deserving inventors themselves, as well as on the gulled public, by the *puffing system*, which is in such universal use in this country. Every new invention or scheme, or publication, whatever may be its degree of merit or demerit, is ushered forth with puffs upon puffs. Dupes are made, and the knaves, who puff and sell, profit at the expense of the fools who believe and buy. And the more discreet or cautious, who know the working of the puffing system, stand aloof, and trust as little to true statements as to the false; and the most excellent and meritorious discovery consequently suffers the neglect, and its trial and introduction are opposed by the incredulity, with which the same class would treat the "Chinese tree-corn;" and they view the discoverer with suspicion, and deem him as little worthy of truth, as the noted introducer of that humbug, and of the notable plan of making dupes *for the sake of charity*. By the way—the extensive sale of "Chinese corn" at 25 cents and $1 the ear, must have made the charity fund of considerable amount; and it is time that Mr. Thorburn should publish his report of the charitable purposes to which this great harvest of profit was to have been appropriated, according to his promise. It is said that this small stock of miraculous corn has proved to be as inexhaustible as the widow's cruise of oil; and it may be safely admitted that, whether it deserves, or not, the seller's recommendation for extraordinary productiveness, *while growing*, that no corn, before known, ever grew so fast in quantity *after it had been gathered and offered for sale*.

QUERIES ON CHINCH-BUG AND OAT-LAY.

To the Editor of the Farmers' Register.

Nansemond Co., July 14th, 1839.

Will you, or some of your many contributors, have the extreme kindness to inform a subscriber, what course to pursue to rid himself of the chinch-bug? My crop is quite much infested with them, and I fear will be seriously injured; they (the chinch-bugs) having been introduced on my farm I suspect by some seed wheat which I purchased of a neighbor. Also the most speedy and economical mode of resuscitating land which has been over-dosed with marl; the idea has suggested itself to me that by turning in a green crop of oats would be beneficial.

What think you of an oat-lay as an improving crop? the seed cost much less than any thing else which we could seed the land in; but the objections to it would be, that they would have to be turned in during a very busy season, and the land would be exposed to the sun until covered by a crop of weeds; which might not be speedily on poor land.

Any information on the above subjects, would much oblige your constant reader H.

WITCH GRASS[*]

Mr. Editor.—Some of your correspondents have been striving to rid themselves and their neighbors of that troublesome weed, witch grass. Now I happen to know from experience one of the easiest and most profitable methods of destroying this grass. This grass will never increase in pastures. It always finds its way into such land as has a warm light soil and is most cultivated. Land abounding in this weed should be immediately converted to a sheep pasture, and in a few years it will be entirely eradicated.

My father once took a piece which was thickly set with it, ploughed it late in June, sowed it with winter rye and turned it into his sheep pasture.

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[*] We believe that this is the New England name for what is called wire grass in Virginia, and couch grass in England.—Ed. F. R.

The rye continued to come up for a year or two and was kept closely fed by the sheep, and in a few years the witch grass was exchanged for sweet clover and red-top. I doubt not but that this plan might be adopted to advantage on many farms that are overrun with this useless weed. It is folly to talk of digging it up when it has obtained a firm foothold. Land that is of a light thin soil can be changed from tillage to pasturing to great advantage. Pastures would be improved in this way, for it is bad economy to possess a pasture that will give only now and then a spot that cattle will touch.

Another method I have seen practised in ridding small garden spots of this grass, which is by laying boards closely over the ground for a season. This is much easier than to dig it up. While on this point I cannot help noticing one fault among gardeners. They are very anxious to prevent the weeds from going to seed during the first part of the season, but as soon as the plants get a little start, they suffer the weeds to take their own course. Consequently there is a fresh supply of seed for the succeeding spring.

If some of your correspondents will counsel me in killing thistles with as little labor and as much profit, as I have advised them in killing witch grass, they will receive my sincere thanks.

AGRICOLA.

REMARKS IN REGARD TO THE MANUFACTURE OF SALT, BY SOLAR EVAPORATION, WITH COVERED WORKS.

As contained in a pamphlet, submitted to the first subscribers to the La Fayette Salt Company.

It has been ascertained from the most authentic and respectable sources, that the net profit arising from the manufacture of salt, by solar evaporation, from sea water, at Cape Cod, in Massachusetts, in the latitude of about 42 deg. north, has not been less, for many years past, than 15 per cent per annum, upon the amount of capital invested, notwithstanding the reduction of the duty upon the imported article; and in some very favorable seasons, from 18 to 20 per cent has been realized. This profit is the result of about four month's favorable weather; for, though the works are in operation seven months in a year, yet the evaporation in the spring and fall is so slow, that little is gained by it. The sea water made use of, contains about three per cent of salt, and is thrown at once into wooden pans, without being strengthened from exposure to the rays of the sun in natural reservoirs.

The Island of Key West is situated in the latitude of 24° 25′ N, which differs but little from the latitude of the Bahama Islands; and its climate and vegetable productions are similar. Its salt pond, which measures 340 acres, offers a greater extent of surface than any of the Bahama salt ponds, with the exception of that at Rum Key.

It is estimated that the evaporation in the latitude of Key West is at least *double* that which is found to exist in Massachusetts;—and salt can be made every day in the year, if the fact stated by the northern manufacturers as undeniable, affords any criterion whereby to judge, viz:—that salt will make with them, with the temperature of the weather at 48 deg. of Fahranheit. At Key West, the annual average of the temperature is 76 degrees, and the thermometer has only once, since the settlement of the island, indicated so low a temperature as 48 degrees. It is confidently believed that the winter months at Key West are quite as favorable for evaporation as the summer months in Massachusetts.*

The sea water at Key West, is believed, from experiments made, to contain a greater percentage of salt, than at Cape Cod; the water, however, which would be appropriated to the purposes of salt making with covered works, will be obtained from the natural pond, which, on an average throughout the year, is at least ten per cent stronger than sea water, and has been known, in very dry seasons, to reach the point of saturation, and, in many parts of it, to deposite large quantities of salt. Sub-reservoirs may be constructed upon the margins of the pond, of any convenient size required, at a trifling expense, in which the evaporation would be three or four times as great as in the large pond, inasmuch as the depth of water in these reservoirs could be regulated at pleasure.†

The great expense attending the manufacture of salt in Massachusetts, is the necessity which exists for reservoirs and pans to bring the water to the point of saturation. Nine out of every ten pans are employed for this purpose, consequently, could they obtain water or brine at the point of saturation, with which to fill their pans in the first instance, their production, and consequently their profit, would be just ten times what it is at present, from the same investment of capital; and in the same proportion for any intermediate strength at which they may first obtain their water. Hence is seen, at once, the great benefit which manufacturers of salt at Key West will derive, from possessing a natural reservoir of water, so considerably increased in strength.

The rate at which salt is sold in the United States, admits of the construction of expensive works for its production; while its abundance and cheapness in the Bahama Islands is such that it can be advantageously introduced into this country, notwithstanding the protecting duty of 10 cents on 56 lbs, making from 13 to 14 cents on the measured bushel. In so bulky an article as salt, it is at all times important, that its transportation should be attended with the least possible expense;[‡] in this particular, few places possess the advantages of Key West. It offers a safe harbor, of easy access, before which vessels are constantly passing in ballast, on their way to and from the ports in the Gulf of Mexico, and in the harbor, ships of the largest class can receive the salt from boats, which can carry it direct to them from the pond, which is less than two miles distant.

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* Should also have given the number of *fair* and *windy* days which, however, can be seen in the metereological registers kept the last six years. H. P.

† Both reservoirs and sub-reservoirs can be constructed in the open sea on the north side of the islands from Matacumba to the north-east extremity of Key Larga, as they are protected from the force of the waves by the shallowness of the waters between them and the main coast from Cape Table to Cape Florida. From the north sides of these islands extend level flats of thousands of acres of stiff marl which are *entirely bare at low water*, *i. e.* six to twelve inches above low tide; and the greatest extremes of tides here do not exceed 3½ feet between the highest spring and lowest neap tide, while the average rise and fall is but three feet. Hence all that would be requisite to form reservoirs would be simple ditching and embankment of the marl four feet high!! What a field for the employment of the ditching and embanking machine!! Now that Indian hostilities have ceased; it is to be hoped that many invalids and capitalists will spend next winter in cruising among these Keys to judge themselves of the profits to be made either in salt manufacture or *textile* agriculture, among these hitherto despised and calumniated islands!

As an evidence that evaporation goes on more rapidly as you approximate the equator, Newman Kershaw, Esq. erected a small set of covered works a short time since at Morris' Island, South Carolina, which is in latitude 32° 40′, where, from sea water, and without the aid of a natural reservoir, he makes from 30 to 33 per cent per annum, upon the capital invested.

As an additional proof of which, see the following extract of a letter, from a highly respectable gentleman residing at Turk's Island, which is in latitude 21° 30′ N. addressed to Mr. John Whitehead.

"I notice by a Key West Register of the 5th of March, (which recently fell into my hands) that you have already been put in possession of some information on the subject of making salt by solar evaporation:—you ask me to state the cost of a pan covering a surface of 10,000 superficial feet:—This, as well as every thing else, you are aware, would depend upon the comparative value of labor, &c. Here, for instance, such a pan would not cost more than $50, and would yield from 1500 to 2500 bushels at a raking. We do not calculate upon more than three rakings in a season, (which is from 60 to 90 days) though five are some times got:—1500 bushels is a fair average for each laborer; it does sometimes, however, amount to as much as 3000 bushels."

From the foregoing data, no hesitation can be felt in adopting the opinion that the manufacture of salt at Key West, offers inducements for the investment of capital, which no other business can present.

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Extract from the Report of the Salt Company.

The "Salt Pond," so called, is a low, flat surface, in the interior of the island, near the north east end, based on limestone, which is covered with a white tenacious marl, impervious to water. It is about on a level with low tide, and so flat, that six inches of water will flow the whole three hundred and forty acres. Formerly, spring tides flowed over into this pond in two different places, and filled it. This water having no outlet, evaporation, and in dry seasons, formed salt in the whole pond without any artificial aid. Now, besides preventing the influx of spring tides, the company have cut a canal through the rock ten feet wide, by which they can either admit or discharge the water at pleasure, and thus hold a perfect control over it.

The company commenced operations in the autumn of 1834, attempting, for the first time to combine the Bahama and New Bedford plans of salt making in the same scheme, and began to granulate salt in the fall of 1835. Not being able to obtain information applicable to this combined mode from any source, they necessarily lost much time and expense. But they instituted a series of experiments, and the result is, the purest and heaviest salt known, from which the bitter water is thoroughly washed, so that it will not "give," or become damp in wet weather.

Heretofore, the company have used but about five acres of pond surface in connexion with two strings of covered works, containing about 5,300 salt work feet built after the New Bedford plan, and have granulated salt in little less than one-third of this covered surface. The yield has been one and six-tenths bushels to the foot of covered surface throughout, or 8,500 bushels per annum. They have now taken in about sixty acres of pond surface, and have made such permanent improvements, as to render this, also, tributary to their covered works, and such additions as may be made hereafter to them. An expense in labor of about three hundred dollars, will add a hundred acres of pond surface more, whenever it may be needed. And a small amount of labor, not exceeding one hundred dollars, will convert the pond or lake of about 180 acres surface, laying to the northeast of the main pond, into an evaporating surface. From this pond or lake the main salt pond is to be fed, by two canals, not exceeding 17 rods in length.

The object of requiring so much evaporation surface is, in the dry season (from December to the last of May,) to bring the water to the point of saturation in the pond reservoirs, and in that state to fill the covered works throughout, and thus make all of them granulating surface, instead of less than one-third, as heretofore. If but *one* raking of salt can thus be obtained per annum, of which the directors entertain no doubt, the yield will be more than doubled—that is, more than three bushels of salt will be made to each foot of covered works. In very favorable years, two such rakings may be thus obtained, with the aid of a covered reservoir, which would swell the yield to an enormous amount.

Three rakings have been made per annum in about one-third of the covered works, by drying down the works full of water three times to each raking; thus about sixty inches of water at the point of saturation is converted into salt. This result is liable to be increased or diminished, as the seasons prove more or less favorable.

The company employ three hands and one overseer, who are amply sufficient to tend six strings of works instead of two: As all the necessary fixed or unproductive capital is now invested, the pond improvements made, and the necessary knowledge acquired, every dollar of additional capital hereafter subscribed, will be devoted to covered works, which promise advantages to the capitalists, not to be looked for in a new company not as far advanced as this.

The fixed or unproductive capital invested by this company, exclusive of real estate, is estimated at $12,000. The works for the last six months, have made over 10 per cent per annum on the whole investment, and will still become more productive, by the daily improvements going on, even if the works should not be further extended.

[‡] Every island on the coast presents this advantage. The salt from the works at Key West has to be first put into lighters to be transported aboard the vessels in the deep water of the harbor, a mile or two distant. And at all places, the reservoirs must necessarily be near a shallow shore. H. P.

Shares are $100 each;—and there have been paid in 184 cash shares. The works may be advantageously increased, from one hundred to one hundred and fifty shares per annum, until the whole amount needed is taken up.

For statements showing the range of the thermometer and quantity of rain, for a series of years at Key West, see American Almanac for 1838.*

F. A. **Browne**, *Pres't.*
A. **Gordon**, *Secr'y.*

INFLUENCE OF THE STOCK ON THE GRAFT. AN ERROR CORRECTED.

From the Farmers' Cabinet.

Sir,—In my paper on this subject inserted in Cabinet, No. 10, page 311, I state in favor of the position (argument 10) that I had read in some British publication, of "the orange grafted upon the pomegranate at Malta, giving fruit which was red inside." This supposed fact was repeated to me ten years since by a commercial friend who had resided at Malta for some time, and I stated it to Mr. Loudon, of London, editor and author of many useful publications on agriculture and horticulture, who declared the circumstance impossible, by reason of the two trees being of different genera.† As I deemed it important to ascertain the truth on the subject, I requested Mr. Winthrop Andrews, Consul of the United States at Malta, to inquire into the subject, and I am pleased to state that he has been enabled to dispel all doubt on it, by a communication dated July 12, 1838, from Professor Terafa, of the University of Malta, and author of some works on botany. This gentleman, after noticing the general prevalence of the error in question, says "our blood or red-colored orange is nothing more than a species of our common orange, as botanically called 'citrus aurantium,' derived from a tree accidentally planted in earth abounding in oxyde of iron, which, in a part of the island is not uncommon, and the same being afterwards propagated by grafting, served to preserve the variety of the species, while it has not the power to change its nature."

The general prevalance of the error may be known from a fact mentioned to me by Mr. Andrews, "that in three publications which recently came under his observation, two in Italian and one in English, the authors have entertained the same opinion on the subject in question, the origin of which is now satisfactorily explained.

The weight which I wished to attach to the supposed botanical anomaly (in argument 10) must now be given up, but I think enough more are adduced of undoubted authority to prove the influence of the stock on the graft, and its fruit.

It was Brydone of England, in his very pleasant book of "Travels through Sicily and Malta," published so long since as the year 1771, that first gave currency to the vulgar belief of the Maltese of the red flesh of the orange being the result of that tree being ingrafted on the pomegranate stock; but it is very probable that, with the majority of mankind, who cannot see the refutation of the error, it will maintain its ground, like the prevalent one in the United States, respecting the flowering of the American aloes only once in an hundred years. James **Mease.**

May 25, 1839.

AN ECONOMICAL BOILER.

To the Editor of the Farmers' Register.

St. Stephens Hill, Fauquier,
May, 1839.

In the 12th number of the 6th volume of your valuable Register, there is an account of "cooking grain for stock," taken from the 'Farmers' Cabinet.' To persons of any reflection or experience, the value of cooking grain for fattening cattle and hogs, feeding milch cows and farm cattle and stock, must be evident. The apparent trouble, delays and expense, of employing machinery generally, deters the unthinking from trying the methods pursued in those countries where the value of time, labor, and fuel is best, and I may say, in comparison with the southern states, only known.

The amount of white and slave labor which was transferred from this state from the year 1833 to '38 inclusive, was immense; and for the same space there was a great decline in the products of agriculture, and the income of the farmers. We made, compared with former times, no crops for market during that period; yet, the value of labor has risen from 75 to 100 per cent. This is to be accounted for in the diminished number of laborers. Such being the fact, there is, then, not only a motive, the result of new notions of economy arising from the general condition of the country, but a necessity for adopting such plans, in our agricultural and household management, as will save time, labor, fuel and food. Superadded to these and other causes of the immediate decline of the profits and great interests connected with the cultivation of the earth, are the multiplied demands upon our incomes for the support of the ever-varying fashions of the day, and the high prices of all articles, whether of necessity, comfort, taste or luxury.

Thus circumstanced, what does prudence suggest to the farmers of Virginia? There can be but one reply. We must adopt a system of improved economy, in the use of time, labor and capital. The cooking of grain for stock constitutes an important item in this system. The preparation of food by cooking is a matter of greater consequence than is generally apprehended. In the countries of Europe, when the value of labor, fuel, time and money, is properly estimated, implements for cooking and preparing the food of farm stock are in general use. Your Register, and other works to be relied upon, give numerous proofs of the efficacy of this mode of fattening cattle and hogs, and of feeding milch cows and stock.

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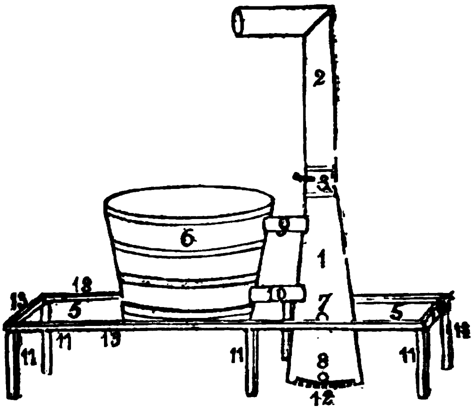
* *Note by H. P.*—As good if not better facilities for making salt exist at numerous Keys, the whole distance from Cape Florida to the Tortugus. In this business, with few laborers, capitalists could profitably invest from ten to twenty millions of dollars; for so long as the evaporation of sea water can be carried on at all in the United States north of 28° of latitude, it must yield at least 100 per cent. more in the latitudes of the Florida Reef; and hence the *cultivation* of these Keys will receive an additional stimulus. It is only with reference to its indirect promotion of agriculture that I should be pleased to see salt manufactories established along the whole course of the Florida Reef.

† I was aware of the objection which, for the reason stated above, might be made against the alledged fact, and quoted two analogous facts from the correspondence of Linnæus, published by Sir James Edward Smyth.

In the absence of a fair reward for our labor by the customary application of it, we must become bankrupt if we do not pursue a different and improved mode of applying it, change our habits of expenditure, and adopt a general and permanent system of economy in all the branches of agricultural husbandry.

There must be a beginning in this reform, which, when effected, will be worth all the reforms ever promised or made in the administration of our government since the presidency of the illustrious Jefferson. Let us then, commence with the use of an implement which will enable us to fatten two beeves or two hogs with the food now given to one—which will double the quantity of our milk in winter—and greatly economize time and fuel in washing clothes, &c. &c.

I know nothing of the implement or structure employed in cooking grain for stock, which is referred to in the article from the 'Farmers' Cabinet;' there is one, however, which I have in use, whose value I can attest. Several individuals have purchased, for this county, the patent right of this machine, which is admirably adapted to the purposes above mentioned. I will give you a description of it. Suppose two coffee pots, one holding a gallon and the other three quarts, deprived of their spouts, handles, and bottoms; insert one within the other, force the upper and lower edges of their peripheries together, and have them well soldered, thus you will have a double cylinder; cut in the outer sheet, within an inch of the top, as also eight or ten inches lower, two circular pieces cut about two inches in diameter; over these holes two copper pipes about five or six inches long are to be soldered, at the bottom of the cylinder, at a right angle to the pipes. Cut a hole an inch in diameter and solder over it a pipe (to draw the remaining water off) of about four inches long. Two arms of copper, (cylinders,) about an inch in diameter, and three inches long are then to be soldered on the outer cylinder just above the centre of gravity, when the cylinder is held erect or vertical. At the bottom in the inside of the inner cylinder, place an iron grate like that part of a gridiron on which the broiling is done. Let there then be placed an iron pipe (stove pipe) about five feet long on the top of the cylinder, having a hole cut near the bottom of it, and closed by a door, (hung on wire hinges,) about 5 by 8 inches. The machine for *heating* the water being now complete, you next have tubs made of such sizes as desired, and have holes bored for the insertion of the two pipes first mentioned. A frame about 5 feet long and wide enough for the arms of the cylinders to rest upon. The lower hole to be placed at the bottom of the tub, placed upon four or six legs, is then made. The places where the arms are to rest are grooved out of the proper size on the bars of the frame, the machine is placed upon the frame, the tub for boiling is also put upon it and adjusted to the boiler. The tub is then filled with water. Fire is placed on the grate, and the cylinder filled with chips or small wood, in fifteen minutes the water will boil. In speaking of the coffee pots I have done it simply for elucidation. The double cylinder of copper should be, for common purposes, about two feet six inches high, the diameter of the bottom or lower muzzle about ten inches, and of the upper about seven.



Explanation.

No. 1.—The boiler.
2.—Stove pipe.
8.—Door for wood in the bottom of stove pipe.
7.—Arms on which the boiler rests on the frame.
8.—The pipe to draw the water off that remains in this boiler.
9 & 10.—Two pipes attached to the boiler and inserted in the tub.
12.—The grate.
6.—The tub for the water, &c., to boil in.
5.—The frame for the boiler and tub to rest upon.
11.—Legs of the frame.
13.—Bars of the frame.

With a few chips, a bushel of potatoes, apples, corn, &c. &c. can be boiled in *half an hour* from the kindling of the fire. If it be desirable to boil a greater quantity a larger tub will be employed. By the use of this machine in boiling wheat-chaff and apples, the milk of my cows was more than doubled. In washing clothes the advantages are equally great, so in scalding hogs. A person not far from here used one of them in preparing the water to scald about 20 hogs; he heated the requisite quantity of water in a hogshead in one-fourth of the time required by the usual mode of hot-stones; and, instead of consuming near a *cord* of wood, *he used but one arm full and a half.* For fattening animals the agency of this machine is very valuable. It is also portable, all its fixtures may be carried in the arms; it is as simple as can be in its structure, and does not cost, or ought not, more than $8. They are made here by a copper smith, and are also made for sale in Baltimore.

I send you herewith a roughly drawn figure of this machine, which will give you a better notion of it than my written description. J. R. W.

THE DIVINING ROD.

From the Farmers' Cabinet.

In almost every age there have been those who have had faith in the virtues of the divining rod for the discovery of springs of water in the earth, but the number of these have been few indeed, at any period.

During a residence of five years in the Island of Jersey, (England,) I had continual opportunities of testing the truth of the pretention; for there lived within half a mile of my house, a person who, every one admitted, possessed the power to an unlimited degree; but knowing that I could at any time indulge in the experiment, I neglected to do so until my removal from thence, when I regretted that I had allowed the opportunity to pass without convincing myself of the truth or falsehood of a *phenomenon* which has interested the world for so many ages.* I had, however, very unexpectedly, an opportunity of re-visiting the island, and then I determined to satisfy myself on the subject. For this purpose, I visited, in company with a friend,† the person above alluded to, and the result is as follows: His name is Ingouville, a resident on his own estate, within a short distance of the town of St. Hellier's, on the Trinty Road, and a highly respectable man. He received us in the most friendly manner, professed himself ready to accompany us, and to make us acquainted with every thing relating to, what he himself accounted, a most wonderful circumstance. He began by furnishing himself with an elm twig, the size of a small quill, cut from the tree so as to form a fork, Y, and taking the double twigs, one in each hand, with the single point forward, he walked into the garden where was a spring of water, not, however, discernible on the surface. On approaching the spot, he desired me to grasp the twigs, which extended beyond his hands, and say if I found them tremble as we walked forwards; in a short time I felt them very sensibly affected, and saw the single point of the rod tending downwards to the earth; he then asked if I felt them twisting in my hands, from an inclination to follow the downward tendency of the point? which I did; he bade me grasp them tightly, with a view to prevent the single point from turning; but this I could not do, although he held the rod very loosely, to give me every facility for so doing. After a few more steps, the point of the rod turned down, in a direct position, towards the earth, in spite of all my endeavors to prevent it. "There," said he, "is the spring," and as I liberated the ends of the rod from my grasp, they immediately took an upright position, correspondent to the downward position of the point of the rod. He then approached the same spot from the opposite sides with precisely the same results. At my request, he repeated the experiment several times, until I was abundantly satisfied of the truth of all that I had heard relating to this curious and wonderful performance. He afterwards pointed out other spots, always with the most perfect success. When I expressed my astonishment at what I had witnessed, he assured me he was at a loss to conceive of the power which resided in him, and was very desirous of knowing if it could be accounted for on philosophical principles. He told us, at the time of the first French revolution, many of the Roman Catholic priests fled for refuge to the Island of Jersey, and amongst them was one who was said to possess the power of discovering springs of water, by means of the divining rod; he was then building the house where he now resides, and having no water, he thought it a good opportunity to put the experiment to the test; he therefore invited the priest to his house, and requested him to try his skill: this he did, and discovered a spring of water a short distance from the building. "I then," said he, "desired him to permit me to try if I also possessed the power, and on taking the rod into my hands found that I did to a greater degree than himself! The discovery quite overcame me, and I should have fallen, had I not supported myself against the wall. I afterwards, by means of the rod, found a spring immediately under the foundations of the new building, and I did not hesitate to dig to it; but, to do this, it was first necessary to turn an arch in the wall, to take off the weight from the foundation, which I did, and struck the spring within 9 inches of the depth which I had calculated." And there I saw the arch (a standing memorial of the truth of what he had related) stretching across a well, which yields a never-failing spring of the purest water. He added, "Since this, I have been sent for, far and near, to find springs for my friends, and I have never been deceived in my operations, although more than 2,000 wells have been dug by my directions." He is enabled to calculate the depth of the spring, by measuring the distance between the spot at which the rod first becomes agitated, and that at which it takes a decided turn downwards, and has attained a surprising exactness in these his calculations. He was requested by Sir T. Le Breton, the Lieut. Baillie of the island, to search for a spring at his house at *Bagatelle*, as the well, from which water was obtained, was only a land drain: singular enough, he could find only one spring, and that was at the *bottom of the well!* "go deeper," said he, stating the depth according to his rule, "and you will find plenty of water." I, sometimes after, received a letter from my friends, Messrs. Jean and Marrett, brewers, stating that Mr. Ingouville had discovered a spring on their premises, *four feet only from their old well*, (a land drain) which furnished plenty of the finest water for all their purpose. Mr. James Hemery, intending to erect a house in a beautiful field near St. Hellier's, Mr. Ingouville searched for a spring, and pointed out the spot where it might be found, stating the depth at which it would be struck; and, without hesitation, Mr. Hemery commenced building in the faith of his prediction, so that the well, when dug, might be enclosed by the court yard wall, and at exactly this spot he found it!

The Island of Jersey is of primitive, or granite formation, of an almost impenetrable character, yet no one, in need of a well, hesitates to dig at the spot pointed out, and frequently, the price for digging has been fixed before-hand, by means of his rule for judging of the necessary depth.

After Mr. Ingouville had satisfied me of the truth of what I had heard on the subject of water finding, he informed me that he had the power of finding money also; he requested me to bury a silver coin in the garden, walking from me, to show he did not wish to see the spot where it had been deposited; *he found it in an instant*, and then related a singular circumstance which occurred during a late search for a spring of water—

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* I have heard that in Cæsar's Commentaries, mention is made of the divining rod, in use for the purpose of discovering wells of water.

† The Rev. Francis Perrot.

many persons were collected to witness the result, but as he passed amongst them he perceived the rod to become agitated in an unaccountable manner, while passing a particular spot, which was crowded by these persons who were looking on; he retracted his steps, but still the rod was affected in the same way; at length, he inquired if a lady, who stood close to the spot, had any considerable quantity of money with her, when she produced a very large quantity of silver in her reticule! after this was removed, the rod performed as usual.

Now I have never heard any attempt to account for the wonderful power which is certainly possessed by this person; possibly, it may be, that there is an affinity between persons of moist constitutions, and the moisture of the earth, and the rod may operate as a sort of conductor: would your friends and contributors do what they can to throw light on the interesting subject?

To those who have not had the means of ascertaining, by actual observation, the truth of what is above stated, it might be interesting to remark, that Mr. Ingouville is a most respectable man, advanced in years, the cultivator of his own estate; independent in circumstances; has never once practised for reward, and will accept of none; and what is better than all, makes no secret about it; declares he is quite ignorant of the means by which he is enabled to operate, but is ready, at all times, to communicate all that he knows about it for the benefit, or to satisfy the curiosity, of any who will call on him for the purpose.

I have been thus particular as to time, place, and persons, in the hope that there might be those amongst your readers who may, from their knowledge of the circumstances, be able to corroborate what I have said relating thereto. The names of those whom I have mentioned, must be familiar to all who have visited the Island of Jersey; and I trust I might through the medium of the pages of the Cabinet, become acquainted with some, with whom I may renew the pleasurable recollections of the period which I passed in that very beautiful and delightful spot.

JAMES PEDDER.

21st *April*, 1839.

For the Farmers' Register.

ESSAY ON VEGETABLE PHYSIOLOGY.

By GEORGE D. ARMSTRONG, Prof. of Nat Philosophy and Chemistry, in Washington College, Va.

[Continued from page 429.]

CHAPTER XVIII.

VEGETABLE EXCRETIONS FROM THE LEAVES AND STEM—FROM THE ROOT. ROTATION OF CROPS.

Besides those substances which are found deposited in the bark and wood of plants, and which we must suppose, if not useful, at least to exert no deleterious influence upon their growth, as there is no effort ever made by plants themselves, to get rid of them; there are others, which we must conclude to be of a different character, as we find them constantly thrown off by plants during their healthy growth. As the roots of plants appear to be capable of making no selection in absorbing their food from the soil, but take up every thing which is presented to them in a sufficiently fluid form, a power of rejecting such matter as is found unsuitable to their nourishment, is necessary to enable them to keep their vessels from being clogged with foreign matter, and thus rendered unfit for the performance of their vital functions. A part of this matter thus rejected by plants exudes from the stem, leaves and flowers, and a part is thrown off by the roots, and deposited in the soil. The elements thus rejected by plants, are not thrown off in their simple elementary condition, but differently combined with each other, so as to form a class of substances, which form their manner of production, have been termed "vegetable excrements." In this particular, these is a striking resemblance between the vital action of plants and animals, and this excrementitious matter thrown off by plants may be considered as precisely analagous to that portion of the food of animals which is voided after all that was nutritious had been selected from amongst it.

The following notice of some of the substances excreted by the stems and leaves of plants is taken from a work of Prof. Lindley. "Acid excretions are formed by the hairs of the chick-pea, the stag-horn sumach and some other species; and it is supposed that the singular property which some lichens possess of imbedding themselves in calcareous rocks is owing to their excretion of oxalic acid. The stinging power of the nettle is produced by an acrid matter excreted by the hairs with which their leaves and stalks are covered. The nettles of Europe simply produce an uneasy sensation, but some of those of India have brought on lock-jaw, and even death itself, by the torments which they inflict. A discharge of sticky matter by the hairs or by the bark of plants, is of very common occurrence. It is this which gives their viscidity to such plants as the rose acacia, to the buds of the horse chesnut, and to the young leaves of the beech tree. In many cases this sticky matter is analogous in composition to common bird-lime. Wax, or some substance analogous to it, is of very common occurrence on the surface of plants. In some instances it is excreted in such quantities as to render its collection an object of trade. The candle-berry mystle (*myrica cerifera*) has its berries covered with a thick coat of vegetable wax, forming in general about one-ninth of the whole berry. It is obtained by throwing the berries into boiling water, when the wax is melted, rises to the surface, and is collected for use. The wax palm (*ceroxylon andicola*) has its trunk covered with a coat of wax resembling myrtle wax in its character. Saccharine matter, in different forms, is also a common excretion from many plants. European manna is discharged by the flowering ash (*fraxinus ornus*) either in consequence of wounds artificially inflicted on the branches, or of the puncture of insects. The manna spoken of in scripture is yielded by a species of tamarisk, and by the camels-thorn, a plant which is common in the deserts of southern Asia. But the most curious instance of matter excreted from the leaves, is afforded by the fraxinella. The leaves of this plant are covered with little brown glands which excrete a species of volatile oil. In warm weather this oil is converted into vapor and surrounds the plant, as an inflammable atmosphere, readily taking fire when a flame is brought in contact with it, and burning without doing any injury to the plant."

The office of excreting such matter as is found unsuitable for the nourishment of a plant is not confined to the stem and leaves but is in fact performed by the root to a much greater extent than by any other organ. That roots in some cases give off a peculiar matter, has been known for a long time; but it is only within the present century that this has been admitted to be a function common to all roots. As has been already remarked, the possession of the power of rejecting such matter as is found unsuitable for their nourishment, would seem to be a necessary condition of the life of plants;' did they not possess it, their vessels must soon become clogged, and rendered unfit for performing their appropriate office. From some experiments which have been performed, it would seem that plants possess the power of disembarrassing themselves of all kinds of matter which are found unfit for their nourishment. Macaire took a plant of mercury (*mercurialis annua*) and having divided its roots into two parcels, introduced one of them into a glass containing a week solution of acetate of lead, and the other into a glass of pure water. At the end of a few hours he found that the glass of pure water had become perceptibly tinged with acetate of lead, which of course must have been taken into the circulation by the roots on one side of the plants, and thrown off again by the roots on the other. In this instance the excreted matter was thrown back without having undergone any change; as a general thing, however, this is not the case; thus, leguminous plants, of which the pea may be mentioned as an axample, although they absorb only carbonic acid and water, will excrete the elements of those substances combined so as to form a species of gum. Grasses excrete principally certain alkaline and earthy muriates, and carbonates, but very little of any gum; papaveraceous plants excrete a bitter matter analogous to opium; euphorbias a gum-resin of a yellowish white color, and an acid flavor.

From observation, we learn that the matter excreted by plants is, as a general thing, thrown out in such a condition as to be, not only unfit again to enter the system of the plant rejecting it, but positively deleterious; and further, that the excretions of different plants differ so much from each other, that whilst that thrown out by a plant is deleterious to others of the same species, it is sometimes well adapted to the nourishment of those of a different species. This fact will explain some of those rules which experience has taught the practical agriculturist. For instance, the rule that the same crop should not be grown for several years in succession upon the same piece of ground. It will not do to say, as is often done, that a second crop of wheat will not grow as well upon any given spot, as the first, because that spot has been exhausted of too great a portion of its nutritive matter by the first. This it is true is one reason, but if it be the only reason, or even the principal reason, we may ask, how is it that a crop of corn will succeed almost as well as if the wheat had never been grown there? The true explanation seems to be that the failure of the second crop of wheat arises not so much from the exhaustion of the soil, as from the existence in the soil of a portion of matter positively deleterious to wheat, deposited by the first crop; at the same time this matter is not injurious to the corn, and hence that crop will succeed when wheat would fail. To grow the same crop for several successive years upon the same spot, is, as De Candolle has very pertinently, though perhaps not very elegantly remarked, "like feeding an animal upon its own excrements." It is much to be desired that this matter should be made a subject of more careful and more accurate experiments than it ever has as yet, as it is one which would doubtless admit of very important practical applications. If the precise nature of the matter retained and of that rejected by each of the crops in common cultivation could once be ascertained, it would seem to be an easy matter to determine the best order in which those crops should succeed each other. Perhaps too if this subject was better understood, we should find that the way in which some manures benefit land, is not by supplying nourishment to the plants growing on it, but by removing this deleterious matter from their roots. If this matter possessed the character of an acid (and there are several facts which seem to render it almost certain that such is the character of the matter excreted by many plants) lime would act in this way; being a salafiable base it would unite with the acid and neutralize its properties. The rotation of crops is a matter very generally attended to in farming, but in gardening, where it is of still greater importance, it is frequently neglected; and as a necessary consequence, garden plants degenerate under so injudicious a system of cultivation. Our best gardeners have been taught by experience never to sow the same plant even for two years in succession upon the same spot of ground.

When the root of a plant is cut off, and the stem placed in water, the excrementitious matter which in other circumstances would have been discharged from the roots, issues from the end of the stem. Hence it is that water in which flowers have been kept for some time, always becomes offensive. We commonly say that the water has become putrid; but pure water can never become putrid, the offensive character of the water in such circumstances arises entirely from the rejected matter excreted by the stem. It is a fact, which I suppose all must have noticed, that some plants when placed in water together seem to keep each other alive, whilst others produce just the opposite effect. This is owing to the nature of the matter excreted by their stems. Where the matter rejected by one plant is of such a nature as to be suited to the nourishment of the other, they will keep each other alive; but where the opposite is the case, they will hasten each others death. In the same way we explain the fact that a nosegay composed of many different flowers, will, when placed in water, generally preserve its freshness much longer than one composed of the same number of flowers of the same species. There is a class of plants commonly called weeds which cannot grow in the immediate neighborhood of our common cultivated plants without materially injuring them. This is doubtless in part owing to their consuming the nutritive matter contained by the soil, and in part also to their overshadowing the cultivated plant and thus shutting it out from the direct action of the sun, but it is also in part owing to the nature of the matter which they deposite in the soil. The common opinion that weeds poison the plants in whose immediate neighborhood they grow, is not mere imagination, it is nothing more than a simple statement of the facts of the case.

It is a curious fact, frequently noticed by botanists, that plants in their wild state, grow in natural groups. This is in part, to be attributed to the varying nature of the soil, such plants as prefer a sandy soil, being collected together where such a soil occurs; and in part also to the operation of the matter deposited by them in the soil. Such plants as deposite matter of a nature fitted to sustain and assist each others growth, will generally be found growing together. It would seem, that in parcelling out the earth, the creator has not assigned particular species of animals alone, to particular portions, and given them the means of defending themselves against the aggression of their neighbors; but that he had taken the same kind of care for plants, at least to a certain extent. If a seed of a plant which properly belongs to one portion, is by accident, thrown upon another, the plants to which that portion belongs, soon destroy it. Thus has the creator fixed for every separate portion of creation, "the bounds of its habitation."

Chap. XIX.

EFFECT OF THE CHANGE OF SEASON UPON VEGETATON. POSITION OF THE SAP AT DIFFERENT SEASONS. DRY-ROT—METHOD OF PREVENTING IT. PROPER SEASON FOR TRIMMING TREES.

A periodical cessation of growth appears to be necessary to the healthy action of most plants, and in this particular we cannot but notice an admirable adaptation of the constitution of plants to these changes of season, which, in some form or another, are common to all climates. It is true, that within the tropics, vegetation is not affected by the alternate heat and cold experienced in extra-tropical regions; but yet, very much the same effect is produced upon plants by the change from the rainy to the dry season in those climates, as by that from summer to winter in our own. The effect of the dry season in the one case, and of winter in the other, is not however to produce an entire cessation of all growth; as it appears from experiment that vegetation is at all times more or less active; in the winter it is languid, whilst it is energetic in the spring and summer. The fact that the buds of most plants swell, and that all plants form additions of greater or less extent to their roots during the winter, forbid us to entertain the idea that there is a total cessation of vegetation at that season. But although plants appear to have the power of absorbing fluids by their roots during the winter, they can have but little opportunity of parting with any portion of it again by evaporation, and as a necessary consequence, their tissues become distended and turgid with the sap thus accumulated. This turgidity of the tissues is at its maximum just before the season at which plants put forth their leaves, and is emimently favorable to rapid growth when vegetation resumes its activity. "It is a well known fact, that after very long winters, or when a plant has been prevented by artificial means from shooting at its usual season, its branches and leaves are developed with extraordinary rapidity," a circumstance to be ascribed entirely to the accumulation of sap in the tissues.

The diurnal changes from light to darkness appear to be equally important to the well being of plants with the annual changes from summer to winter. "If plants were kept incessantly growing in light they would be perpetually decomposing carbonic acid, and would in consequence become so stunted that there could be no such thing as a tree, and this is actually the case in polar regions where the day and night are each of *six* months continuance. If on the contrary they grow in constant darkness their tissues become excessively lengthened and weak, no decomposition of carbonic acid takes place, none of the parts acquire solidity and vigor, and finally they perish. But in ordinary circumstances, plants which in the day become exhausted by the decomposition of carbonic acid, and by the emptying of their tissues by evaporation, repair their forces at night by inhaling oxygen copiously, and so forming a new supply of carbonic acid, and by absorbing moisture from the earth and air without the loss of any portion of it. Such being the case, we must conclude that plants grow chiefly by day, and this is conformable to the few observations which have been made on this subject. Meyer found that the stem of a belladonna lilly, and plants of wheat and barley, grew about twice as fast by day as by night; and Mulder states that he has arrived at similar conclusions in watching the development of other plants.

When speaking of seeds and underground stems, the fact was mentioned that the nutritive matter which they contain, and which constitutes their value as articles of food, is, in the economy of vegetable life, intended for the sustenance of the young plants to which they give origin, during the early stages of the growth of those plants, and before they have become sufficiently developed to acquire nourishment for themselves. The heart-wood of trees appears to stand in a somewhat similar relation to the young buds of a tree, serving during the winter as a depository for the turgid sap which the plant accumulated, and yielding it up again, so soon as the flow of the sap has fully commenced in the spring. The sap which accumulates in the sugar maple *(acer saccharinus)* during the winter, contains a large portion of sugar in its composition; in the spring, as the watery sap imbibed by the roots ascends the stem, it gradually dissolves this sugar out from the heart-wood, and carries it up for the nourishment of the then swelling buds; of course, the higher the sap ascends the stem, the more of this sugar will it have dissolved; and this is the reason why, it is found necessary, in tapping that tree for the purpose of obtaining sugar from its sap, that the openings should be made high up the stem, and not near the root; and further, that they should be made to enter the heart-wood, and not to pass through the bark alone. I know that these facts respecting the sugar maple have been adduced in support of the idea that there is no such thing as a downward flow of the sap, and that its elaboration instead of taking place in the leaves, takes place gradually during its ascent; but the downward flow of the sap is established by so many incontrovertible facts, that even if we could not give any explanation of this matter, we could by no means admit it as establishing the theory just adverted to. But in this matter we are not left to mere conjecture. That the facts respecting the sap are as I have stated them, any one may satisfy himself by a very simple experiment. Let a young oak or maple be cut in June, and a piece taken from the body of the tree be laid upon the fire; after a little while there will appear a wet circle, describing the exact thickness of the sap-wood, and when it becomes thoroughly heated, the vapor will rush with violence from the vessels of that part of the wood, whilst there will be but little, if any, appearance of vapor over the surface of the heart-wood. Let another stick precisely similar in character, be cut in January, and subjected to the same process; so soon as the stick becomes heated, the whole surface of the heart-wood, excepting perhaps a very narrow circle immediately around the pith, will become wet, and send forth steam in abundance, whilst the sap-wood will remain perfectly dry. If the sap which issued from the heart-wood in the last experiment be tasted, it will be found very sweet, thus rendering it certain that sugar enters largely into its composition. The facts of the case as thus ascertained by experiment are, 1st, that the heart-wood contains during the winter a large portion of sap very rich in sugar; 2nd, before the summer has fairly set in, this is all removed; and 3rd, that in the spring a watery sap enters the roots of the tree, and flowing up partly through the heart-wood, becomes more and more richly charged with sugar as it ascends. In view of these facts, can any one hesitate which explanation to adopt?

A knowledge of the position of the sap at different seasons of the year, is of great importance to those engaged in cutting timber; and as all farmers are oblige to engage in this business more or less frequently, they will find this a matter well worthy of their attention. It is now, I believe, universally admitted that, that disease so fatal to timber, the *dry-rot*, arises from the presence of the sap, more especially of the thick turgid sap which cannot be well removed by seasoning. If then such sap fills the tissues of the heart-wood during the winter, whilst they are free from it in the summer, we will at once see the bad policy of cutting timber in the winter, as is the common practice; and also a reason why the timber of the ancient Romans (who it is believed usually cut their timber in the summer) lasted so much longer, than our timber at the present day. I do not know that I can place this subject fully before my readers in any better way, than by transcribing a part of a communication which appeared in the 34th vol. of the American Journal, written by Phineas Rainey, a ship-builder of Connecticut.

"It was the general custom here, to cut timber for vessels in the winter, notwithstanding they went into decay, and wanted repairing in about seven years, or from that to eight, whilst a few only lasted twelve years. I ascribed this variation in their durability to the fact that the cutting of timber was often commenced in October, and then continued through the intermediate months to March. I therefore concluded that the right season was in December, when I supposed that the sap was certainly in the roots, and if cut at this season, I believed that it would leave the deadly poison in the stump, whilst the body and branches would be entirely free from its influence. I determined to carry this opinion into practice the first opportunity that occurred.

"In 1810, I was concerned in the building of a small freighting ship, of which I was the sole conductor, from her keel until she was completed and ready for sea. According to my previous determination, I commenced the cutting of the timbers for her in the early part of December, and continued it into the first week in January. By so doing, I expected to produce the very best ship for durability on the Connecticut river, where there were then numerous vessels building. The timber selected was white oak and white chestnut.

The vessel advanced, and in April it was found that three of the quarter top timbers were wanting, and (as very crooked pieces were required for these) I was obliged to go into the woods and have them cut. Sometime in May, it was found that the stick designed for plank-sheers (this was very large, and intended to make the whole that was wanted,) would not answer the purpose, except that it was barely sufficient to go around the bows, the other part being badly rent and of course rejected. I therefore went into the woods a second time, when the leaves were full grown and the bark would peel, and had two thrifty white-oaks cut for the after pieces. These timbers were put in immediately, and so were the plank-sheers, without any seasoning whatever, and the room between the timbers above the air-streak was filled with salt, which was supposed to be a preventive against the dry-rot. The workmanship was of the first order.

"The vessel was launched and completed in July 1811. That autumn she went to sea, and after the declaration of war in 1812, she came to Middletown and was laid up until the peace of 1815. In that spring when she was to be fitted out again, it was found that she must be repaired in her hull; and on opening her, it was perceived that the dry-rot had made such destruction among her timbers, that it was necessary to build her anew from her middle-wale up. But the three quarter timbers spoken of, which had been cut green, were sound, and appeared new, although their neighbors on each side of them were destroyed by the disease; and it is a remarkable fact, that the spikes, when pulled out of them, were bright, and appeared new; but those parts of them which come in contact with the outside planks, (which were made from timber cut in December,) were badly oxidated, so much so that they were reduced in size about one quarter. The forward plank-sheers which it will be remembered were cut in December, were destroyed by the disease; but the after pieces were sound and dry, and on the under side appeared like new timber seasoned in the shade, and what is remarkable as to them is that although some of the timbers on which they rested were so decayed that they might be picked to pieces; yet there was not the least appearance of it on them, which showed that although surrounded by corruption, they were themselves at least up to that period incorruptible. Thus it can be seen, as respects this vessel, that not only the season of the year, which in the popular opinion is the best to cut timber in for the purpose of making it last well, was strictly adhered to, but also the precautionary measure of applying salt, which is even at this day thought to retard the progress of the disease.

"Although at that time it was not thought necessary to repair this ship below the middle-wale, yet I have every reason to believe that the poison had begun its work in her timber from light-water mark to her top-side; for, in 1816 or 1817, in a perfect calm, she sank at sea, a poor miserable decayed hull, a melancholy comment on the folly of cutting timber for vessels in the winter months. By inquiring since, I have always found that of those vessels which last the longest, the timber of which they were constructed was cut the farthest from December. When I have known the period at which certain trees have been cut, and also their locality, I have afterwards year after year examined their stumps, and watched their decay; and have invariably found that in those of them which were cut in the winter, the disease first made its appearance in the heart-wood, and continued its ravages until that was destroyed, and up to that period the alburnum was comparatively sound; whilst in those which were cut in the summer, the disease first made its appearance in the alburnum, which in a few years entirely disappeared, whilst the heart-wood remained sound.

"There are numerous facts in the most common transactions of life that will sustain me in my position. I believe that the general practice throughout the northern and middle states, is to peel such trees as are to be manufactured into ship plank; by saving the bark, this probably makes the business more profitable than it would otherwise be. It is invariably the case that by the time the plank has become thoroughly seasoned, the alburnum becomes so much injured by the dry-rot as to be unfit to be used; and for my own part, I never saw any timber of this sort, where the heart-wood was affected at all, unless the tree had evidently contracted the disease before its death. The season for peeling is from the third week in May to the second in June. Farmers cut their rails in the summer, when the bark will peel, and they last from fifty to a hundred years. They account for the fact in this way; if they cut them in the winter, the bark will stick fast to the rails, and after a little while, the water gets under it and causes them to decay sooner. On the contrary, they cut their posts in the winter; probably this is done for the convenience of cutting holes in them at that season; and although their rails last so long, yet their posts begin to decay in seven or eight years, according to the soil in which they are placed. When from necessity they are obliged to cut a few posts in the summer, (with the expectation however that they will soon decay) if they last thirty or forty years (and there are instances of this kind) they speak of it as a very remarkable circumstance but never inquire into the natural cause, nor alter their practice. There are other instances of the extraordinary longevity of timber; wooden abutments to bridges, pumps, piles, foundations of weirs, coffer-dams &c, a full notice of which would fill a volume; all going to show that there is a season in which if timber be cut, it will last for many years beyond the average time for which it now lasts; and that there is a season in which if it be cut, it will not last over eight or ten years, notwithstanding any artificial process through which it may be made to pass. In my opinion, June is the best time in which to cut timber, in order to make it last, though I do not suppose that it would make any great difference if it were cut in either of the other summer months.

"At the period at which I was strenuously advocating the doctrine of cutting timber in the winter, I had a small apple tree which had been engrafted with a choice fruit, and had been growing perhaps seven or eight years. There was one limb on it which I did not like, because it was growing in a wrong direction. I took it off in December, because I believed the sap to be then in the roots, and therefore at this season there would be none of it wasted or taken away with the limb, and of course the branches left would receive a greater portion of nourishment in the spring. Sometime afterward, I examined the tree, and found that the part or stump of the limb which remained within the surface of the body, was affected with the dry-rot in its purest type. I removed this with my knife, and found that the disease had made its attack on the body of the tree itself. The tree, after the limb was taken off, became sickly, and its fruit after it began to bear was imperfect.

"I would here observe, that it is the common practice, when people cut the timber of a house frame, to do it in the winter, because, as they think, it will be more durable; but they will not trim their trees at that season, because they have learned from experience that if they do, the trees will contract the dry-rot; therefore they do it in the spring. But Dr. Ives of New Haven, goes even further; he trims his trees in June, and thinks they do better at that season of the year, because the wounds heal quicker. This is right, for as the immediate cause of the disease is not contained in the heart-wood at that season, therefore the remaining stump being almost all heart-wood, can never be attacked by the disease, and the wound will heal quicker; but if the trimming be done in December, the cause of the disease is contained in the stumps at that season and as they cannot be removed, the consequence is, that the disease soon attacks and destroys them, and then the wound will never heal. Although trees thus situated, may by their abundant foliage, their extended branches and their smooth bodies, appear to be in perfect health, (which is sometimes the case) yet they are doomed trees; for the canker having entered into their organization, is preying upon their very vitals, and will sooner or later, prostrate them in the dust."

In the communication from which the preceding statements have been taken, there are many other facts given, all going to establish the same point; viz., that timber should be cut, and trees should be trimmed in the summer, and not in the winter, as is the common practice. I should remark, however, that these statements concern more especially such timber as the oak, chestnut, &c., and not those trees whose heart-wood is filled with resinous matter, such as the different species of pine; in the case of these last mentioned trees, I do not suppose that it will make much difference at what season they be cut. Perhaps it may be objected to cutting timber in the summer, that a farmer is generally so busy at that season, that he cannot spare the time necessary, from his other occupations. But let it be recollected that it is not necessary that the timber should be fully prepared for its intended use at that season, but only cut down, or perhaps even girdling would do, if it be made sufficiently deep to kill the tree, and the work may then be left to be finished at a time of greater leisure. Should a farmer be obliged to hire this done, the expense incurred would be far more than repaid him, by the additional durability of the timber.

Chapter XX.

CHANGES IN PLANTS, PRODUCED BY PUNCTURE OF INSECTS, CHANGES IN CLIMATE AND SOIL, GRAFTING, BUDDING AND PRUNING, CROSS FECUNDATION, BLANCHING, AND PROPAGATION FROM SELECT SEED.

When we look at cultivated vegetables as they are now presented to the eye, we seldom think of the unpromising sources from which most of them have sprung; or of the great changes which it was necessary they should undergo, before becoming fit to minister to the necessities or pleasures of man so largely as they now do; or of the different and distant regions which have been laid under contribution to furnish that variety of vegetables possessed by the different civilized nations of the earth. "The austere crab-apple of our woods, is the original stock from which all our apples have sprung; and the numerous varieties of plum, can boast of no other parent than our native sloe." The fig came originally from Syria, the orange from Media, the peach from Persia, the apricot from Epirus, the pomegranate from Africa, the cherry from Armenia, wheat, probably from the East Indies, maize and the potato, from Mexico. "Wherever man has penetrated, in that spirit of change and activity which accompanies civilization, he has assisted the dissemination of vegetable productions, much more surely and rapidly than birds, or ocean currents, or winds, or indeed all natural agents put together." From a consideration of such facts as these, we may learn to how great an extent the agricultural riches of any country, whether we have regard to the excellence of its products or to their variety, are dependent upon man. There are but few, if any plants, which in the wild condition, are well adapted to use, and there are none which may not be improved by a judicious system of cultivation; and there is no country which can furnish any great variety of useful vegetables, without levying contributions upon other and often distant lands. From all this it is evident, that although the general laws which govern vegetables are fixed, yet vegetables themselves may undergo many changes, both by accidents and from the arts of man. A consideration of some of these changes, and the means by which they are produced, will be the subject of the present chapter.

Among the most important of those causes by which changes are produced in plants are, the puncture of insects, change in climate and soil, grafting and budding, cross fecundation, blanching, and propagating from selected seed. To each of these subjects we will attend, in the order in which it has been mentioned.

1*st*. *The puncture of insects*.—There are many insects, whose instincts teach them to puncture the bark of vegetables in order to deposite their eggs. Whereever this is affected, a diseased condition immediately ensues in the part punctured, always resulting in the developement of a tumor of greater or less size. This is generally accounted for by saying that the insect, at the same time at which it deposites its egg, deposites along with it some matter which is poisonous to the plant. The formation of the tumor is generally accompanied with the elaboration of some particular vegetable substances which would otherwise, either not have been formed at all, or else would have been formed in very small quantities; and in consequence of their containing this particular substance, whatever it may be, these tumors are collected and used in the arts. A good instance of this is afforded in the production of the nut-gall. Whilst the bud of the species of oak on which these galls are formed, is yet young, a species of cynips drives its piercer into the very pith, and depositing its egg, injects at the same time a small drop of a corroding liquor contained in its bag. The bud being thus wounded, and the juices corrupted by the injected poison, a fermentation is induced, which results in a partial disorganization of all the contiguous parts. The extravasated juice flows round the egg, and is there accumulated, and converted into a sort of spongy lump, which vegetates and augments till it forms the gall. The gall thus formed, furnishes both shelter and nourishment to the young insect so long as it remains in its larva state, but so soon as it has completed its metamorphoses, it eats its way out and escapes. During the formation of the gall, a large quantity of gallic acid is elaborated by the diseased parts, and this it is which fits the gall for its use in the arts.

Perhaps the most curious instance of the effect produced by the puncture of an insect, is that afforded by the fig. "The fig (*ficus carica*) has no visible flower; for the fruit arises immediately from the joints of the tree, in the form of little buds, with a perforation at the end, but not opening, or showing any-thing like petals, or the ordinary parts of fructification. As the fig enlarges, the flower comes to maturity in its concealment; and in eastern countries the fruit is improved by a singular operation known by the name of caprification. This is performed by suspending above the cultivated figs, branches of the wild fig, which are full of a species of cynips. When the insect has become winged, it quits the wild fig, and pierces the cultivated ones for the purpose of laying its eggs; and thus it appears both to insure the fructification by dispersing the pollen, and afterwards to hasten the ripening of the fruit, by puncturing the pulp, and inducing a morbid action of its tissues. In France this operation is imitated by inserting straws dipped in olive-oil. Respecting the puncturing of insects, it is perhaps worthy of remark, that each particular species of insect appears, as a general thing, to be confined to some particular kind of plant, and that the effect produced by each kind of insect is uniform. In form, these tumors differ much from each other; the nut-gall is an irregular ball, the tumor produced upon the leaf of the hickory by the puncture of the gnat, has no regular shape whatever, whilst that produced by a similar insect upon the leaf of the grape-vine, always present the form of a horn and is of a beautiful purple color. The time which elapses between the deposition of the egg, and the appearance of the insect, varies much in the case of different species. The egg which is deposited in the pea whilst yet green, is seldom hatched out until the succeeding summer; whilst other species appear in the course of a very few days.

2*nd*. *Changes in climate*.—Though plants in general are limited to certain countries in which they appear as natives, yet some are, and probably the greater number may be, inured to climates soils and situations very different from those to which they naturally belong. The change which a plant undergoes in accommodating itself to a new country is called acclimation. By this process the habits of a plant may be much altered, as we see in the case of the nasturtium, which in Chili S. A. its native country, becomes a tree of considerable size, and does not blossom until several years after it is planted; whilst in our climate it is an annual trailing shrub, blossoming and perfecting its fruit the same year in which it is sown. But though the habits of a plant may be thus altered, yet no device of man can alter its nature. The potatoe which has been long cultivated in Europe, and propagated from seed ripened there, and this through innumerable generations, yet there is no reason for supposing that it is in the least degree more hardy now than when first imported from Mexico. The same slight degree of autumnal frost blackens its leaves, and of spring cold destroys its germinating buds. Annual plants are much more easily acclimated in northern countries, than perennial ones. This we should expect from the fact that the temperature of real summer weather is very much the same in all inhabited lands, the only serious dificulty experienced in removing southern plants to a northern country is that the summer is sometimes too short to enable them to come to perfection. Where this is the case, the proper method to be pursued is to make the change as gradual as possible, removing the plant a little further north each year than it was the year preceding, and thus enabling it gradually to adapt itself to its new situation. Next to annuals, in the case with which they undergo acclimation, we must reckon herbaceous biennial and perennial plants. In northern climates, the frosts of winter are generally accompanied with snow, which falling early in the season, and lying throughout the winter, shelters the root from the inclemency of the atmosphere until the return of spring. Trees and shrubs, on the contrary, are acclimated with difficulty, owing to the great length of their stems and branches rendering it impossible to shelter them from the cold. "The greatest refinement in culture consists in the successful formation of artificial climates, for the culture of tropical plants in cold regions. Many vegetables, natives of the torrid zone, as the pine-apple, palm &c. cannot be acclimated in temperate countries; but by means of hot-houses of different kinds, they are grown, even on the borders of the frozen zone to the highest degree of perfection; and in Britain, some of the tropical fruits, as the pine and melon, are brought to a greater size, and better flavor, than in their native habitation. Casting our eye upon man, and the effects of his industry, we see him spread upon plains and the sides of mountains, from the frozen ocean to the equator, and yet in all situations assembling around him whatever is useful or agreeable from among the products of other lands."

3rd. *Change in soil.*—A change in soil may be effected either by removing a plant from one spot of earth, to another differing from it in fertility; or by the addition of manure, producing a change in the character of the soil in which a plant grows, without changing the location of the plant. The effect of removing a plant from a comparatively barren to a more fertile soil, is to increase the size of all its parts, and often to convert its organs of one kind into those of another. Experience has taught us, that it is advantageous to supply food to plants artificially. Where increase in the size of vegetables, without reference to their magnitude, is desired, it can almost always be accomplished, by affording an increased supply of all the ingredients of the food of plants, distributed in well pulverized soil, in such a manner that the roots of the plant can easily reach it. The effect thus produced, can be greatly increased by additional heat and moisture; and by a partial exclusion of the direct rays of the sun, so as to moderate the evaporation of fluids from the plant. Experience alone can determine to what extent this may profitably be carried in the case of each species of vegetable. The results which have been produced in some instances are truly remarkable. Loudon states that cabbages have been produced weighing half a hundred weight, apples, a pound and a half, and cabbage-roses of four inches in diameter, or more than a foot in circumference. By cultivation and change of soil, the appearance of many trees have been entirely altered. The wild crab-apple, which is the original stock from which all our vast variety of apples have sprung, has its stem and branches thick set with thorns. On removing it to a more fertile soil and more favorable circumstances, all these thorns have disappeared, and their place have been supplied by fruit-bearing branches. Yet all the distinctive characteristics of the tree, the structure of its wood and bark, the shape and arrangement of its leaves, the form and aggregation of its flowers, indeed all that a botanist would consider characteristic of the plant, have remained unchanged. Perhaps the most remarkable changes which result from a change of soil, are those of organs of one kind into those of another. It is by such changes, that all our double flowers have been obtained. The organs which are most commonly converted into others, are the stamens, and next to them, the pistils. In the hundred-leaved rose, and some other double roses, almost all the stamens have been converted into petals; in the flowering cherry, the pistils have been converted into green leaves; in the double collumbine, a part of the stamens have been converted into petals, another part into nectaries, whilst a third part, have retained their original form. The perfect regularity with which the changes have taken place in the last mentioned flower is worthy of notice. Wherever one stamen has been converted into a petal, a corresponding one has always been converted into a nectary; and so regularly have these changes proceeded, that by careful dissection, you may separate one of these double flowers into several single ones, each perfect in itself, and destitute of none of its appropriate parts. Where flowers have been doubled by art, the only sure way of propagating them, is by some means by which the new plant should be nothing more than a continuation of the old one, as by slips or cuttings. Whenever the seed is resorted to, there is danger that the plant will revert to its original type, and the flowers appear single again. A change of color also, frequently results from a change of soil. Respecting the nature of this change, no fixed laws have been as yet discovered. As a general thing however, the brightness of the colors of a flower is injured by enriching the soil in which it grows; and hence florists, when they wish to procure tulips of very bright colors, prefer planting the bulbs in a light sandy soil, which is rather poor than otherwise.

4th. *Grafting, budding and pruning.*—The object of all these operations is the same, viz. to secure to some part of a plant a greater quantity of nourishment than would otherwise fall to its share, and thus to produce a more full and perfect developement of that part. Where a young shoot is grafted upon a stock three or four years old, it will evidently receive a much greater quantity of nourishment, than it would in its original position or its parent stem. The rules to be observed in grafting and budding, have been mentioned, and the reasons on which they are founded given in a previous chapter. It will be sufficient here, merely to advert to them. The most important are, 1st, that the bark of the graft should have its cellular or vascular tissues, arranged in the same way with that of the stock; 2nd, that the graft should be so placed that the inner surface of its bark shall correspond precisely with that of the bark of the stock. The proper season for grafting, is in the spring, just as the buds begin to swell; the reason for this is, that at that season, the graft is just commencing the period of its most rapid growth, and it will, of course, sooner unite with the stock at that season, than at any other. The object of pruning, is, to remove such branches and boughs as are not wanted, in order that the whole vital energy of the plant may be expended upon such as are left. Of course, which shall be removed, and which left, must be determined by the judgment of the pruner, in the case of each tree. The only general rule, is, that in the case of fruit trees, what are termed water-sprouts, (a class of straight shoots which seldom bear any thing but leaves) should be removed. The proper season for pruning trees, is when the leaves are just fully formed, because in this way, you avoid exposing the heart-wood to an attack of the dry-rot, and moreover inflict the necessary wound at at a time when the tree is growing most rapidly, and when of course the wound will soonest heal over.

5th. *Cross-fecundation and blanching.*—Both of these operations have been fully treated of in the preceding chapters of this essay.

6th. *Propagating from select seed.*—There is perhaps no general principle of vegetable physiology, which it is more important for the agriculturist, who seeks to improve the character of cultivated plants, to bear in mind, than that the offspring will always partake of the characrer of the parent plant to a greater or less extent. This same general principle applies to animals as well as vegetables, and it has been by keeping it distinctly in mind, that the stock of our common domestic animals has been so much improved as it has of late years. In the case of animals, the results have been so striking, that they have awakened general attention to the subject; but in the case of vegetables, although I suppose there are none who would deny its correctness, yet it is generally neglected, or regarded with comparative indifference. Plants, as a general thing, resemble their parent plants in form, in texture, in the abundance, richness, and flavor of their fruit, the time at which they ripen their fruit, in their liability to disease, and in fact, in almost every particular which can affect their value to man.

As this subject will be more fully treated of in a subsequent chapter, we will dismiss it for the present.

(To be continued.)

SALTING BUTTER.

From Anderson's Essays.

On some occasions, a part, or the whole of the butter may, perhaps, be disposed of fresh; but in general it must be salted before it can be carried to market. And as this part of the process requires as great nicety as any other, a few remarks on the subject shall be added.

Wooden vessels are, upon the whole, most proper to be employed for containing salted butter. These should be made of cooper work, very firm, and tightly joined with strong *wooden* hoops. It will be advisable to make them very strong where circumstances permit them to be returned to the dairy; for as it is a matter of considerable difficulty to season new vessels so well as that they shall not affect the taste of the butter, it is always advisable to employ the old vessels rather than make new ones, as long as they continue firm and sound. Oak is the best wood for the bottom, and staves, and broad Dutch split hoops are to be preferred to all others, where they can be had. Iron hoops should be rejected, as the rust from them will in time sink through the wood, though it be very thick, and injure the color of the butter: one iron hoop, however, should be put at the top, and another below beyond the bottom, the projection below the bottom being made deep for this purpose. No form is more convenient than that of a barrel, unless, perhaps, it be that of a truncated cone, with the apex uppermost; as in this case the butter never can rise from the bottom and float upon the brine, which it will sometimes do in the under part of a barrel when brine is necessary. But this inconvenience may be easily obviated, by driving a wooden peg, with any kind of a head, into the bottom before it be filled, as the butter, closely embracing the head all round, will be kept perfectly firm in its place.

An old vessel may be prepared for again receiving butter, by the ordinary process of scalding, rinsing, and drying; but to *season* a new vessel requires greater care. This is to be done by filling it frequently with scalding water, and allowing it to remain till it slowly cools. If hay, or other sweet vegetables are put into it along with the water, it is sometimes though to facilitate the process. But in all cases frequent effusions of hot water are very necessary, and a considerable time is required, before they can be rendered fit for use. The careful dairy-man ought to be particularly guarded with respect to this particular, or he may soon lose his character at market.

After the butter has been beaten up and cleared from the milk, as before directed, it is ready for being salted. Let the vessel into which it is to be put, after being rendered as clean and sweet as possible, be rubbed all over in the inside with common salt, and let a little melted butter be run into the cavity between the bottom and the sides at their joining all around, so as to fill it and make it every where flush with the bottom and sides. It is then fit to receive the butter.

Common salt is almost the only substance that has been hitherto employed for the purpose of preserving butter; but I have found, by experience, that the following composition is, in many respects, preferable to it, as it not only preserves the butter more effectually from any taint of rancidity, but makes it also look better, and taste sweeter, richer, and more marrowy, than if the same butter had deen cured with common salt alone. I have frequently made comparative trials with the same butter, and always found the difference much greater than could well be conceived. The composition is as follows:

Take of sugar one part, of nitre one part, and of the best Spanish great salt, (or of Doctor Swediaur's best salt, which is still better than the former, being cleaner, [*or best rock salt,*]) *two parts. Beat the whole into a fine powder, mix them well together, and put them by for use.*

Of this composition one ounce should be put to every sixteen ounces of butter;* mix this salt thoroughly with the butter as soon as it has been freed from the milk, and put it, without loss of time, down into the vessel prepared to receive it, pressing it so close as to leave no air-holes, or any kind of cavities within it. Smooth the surface, and if you expect that it will be above a day or two before you can add more, cover it close up with, a piece of clean linen, and above that a piece of wetted parchment, or, for want of that, fine linen that has been dipped in melted butter, that is exactly fitted to the edges of the vessel all round, so as to exclude the air as much as possible, without the assistance of any watery brine; when more butter is to be added, these coverings are to be taken off; and the butter applied close above the former, pressing it down and smoothing it as before, and so on till the vessel be full. When it is quite full let the two covers be spread over it with the greatest care, and let a little melted butter be poured all round the edges, so as to fill up every cranny, and effectually exclude the air. A little salt may be then strewed over the whole, and the cover be firmly fixed down to remain close shut till it be opened for use. If all this be carefully done, the butter may be kept perfectly sound in this climate for how many years I cannot tell; but I have seen it two years old, and in every respect as sweet and sound as when it was only a month old.

It deserves to be remarked, that butter cured in this manner does not taste well till it has stood at least a fortnight after being salted; but after that period is elapsed, it eats with a rich marrowy taste that no other butter ever acquires; and it tastes so little of salt, that a person who had been accustomed to eat butter cured with common salt only, would not imagine it had got one-fourth part of the salt that would be necessary to preserve it.†

Butter thus cured would bear to be carried to the East or the West Indies, and would keep sweet during the longest voyages, if it were so packed as not to allow the butter to be so far melted as to occasion the salts to separate from it. But as none of these salts admit of any chemical union with the butter, it must happen that if ever the butter be so far melted as to become of a fluid consistence, the salts drop to the bottom, and the butter, deprived of their antiseptic powers, quickly becomes rancid. It would be a great improvement in the culinary art, if any antiseptic substances could be found that possessed any agreeable taste and flavor, which was capable of being dissolved in oily substances. This might afford a proper subject for a premium by Agricultural Societies. In the mean time the following hints on this subject may be of some use.

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* It is of great consequence that every process, which requires much thought or nicety, should be banished, if possible, from all branches of manufacture. On this principle, as some difficultuy might arise in proportioning the quantity of salt to unequal weights of butter, I should advise that every person who means to adopt this practice at large should begin with providing himself with a steelyard so constructed as that sixteen ounces in the one scale is exactly balanced by one in the other. And that he may be at no loss to provide himself with this simple apparatus, the following directions may be attended to.

Let him provide two scales of equal weight; one of them should be of wood, and flat, for the butter, no matter what form or materials the other is of; let him then take a slip of deal two inches broad, half an inch thick, and two feet long. Near to each end, and at about half an inch from the same side at each end, make a hole through the board, to which the scales may be fastened by means of a loop of wire; observe, that these two holes should be placed exactly at the same distance from the edge. Let him then load the two scales, one of them with one ounce, and the other with sixteen, and having drawn a line parallel to what will now appear to be the upper side of the beam, at half an inch from the top all along on each side, let him be provided with two sharp-pointed instruments, such as a shoemaker's awl. Let him then try to find a point in the new-made line on each side of the beam, where, when the beam is allowed to vibrate on his awls placed directly opposite to each other, the two weights balance each other. This point he will soon discover to be much nearer one of the ends of the beam than the other. Through this point let him pierce a hole by means of a round hot iron. Through this hole put a piece of thick iron wire, which if supported at each end will serve as a pivot. The apparatus is now complete.

And whenever it is afterwards wanted, nothing more is necessary than to place the butter, whatever be its weight into the butter-scale, and then to put as much of the composition into the opposite scale as brings the beam to a balance; and this will in all cases be the due proportion of salt for the butter, whatever the weight of that butter may be.

† But after this butter has been cured in the most perfect manner, it may chance to be much debased in its quality by being improperly treated during the time it is using. Therefore observe, that, when it is broken up for use, a small portion should be pared from the surface all over, especially near the edges, in case the air should not have been so entirely excluded as it ought to have been. If it be quickly consumed. it may be then spooned up as it is wanted, without any other precaution than that of keeping it carefully covered up so as to exclude dust, &c. from having access to it. But if it be to be used very slowly, and if the person to be employed in spooning it up be not very careful, or so indolent as not to be at the trouble of closing it up at each time with the covers, it may happen that the part which is thus long exposed to the air may contract a small degree rancidity. To guard against this evil, in these circumstances, when the vessel is opened let a strong brine of common salt be prepared that will swim an egg, and poured, when cold, upon the surface of the butter; this will cover that surface effectually, even though the operator should be a little careless, and will thus guard against the inconvenience complained of: for though the quality of the butter will thus be injured in some degree in consequence of the water acting upon it, yet that is an evil of far less material moment than the slightest degree of rancidity would occasion.

Butter, in its natural state, contains a considerable proportion of mucous matter, which is more highly putrescible than the pure oily parts of the butter. Where it is, therefore, intended that butter should be exposed to the heat of warm climates, it ought to be freed from that mucilage before it be cured and packed up from keeping. To prepare butter for a distant voyage, therefore, in warm climates, let it be put into a vessel of a proper shape, which should be immersed into another containing water. Let the water be gradually heated till the butter be thoroughly melted; let it continue in that state for some time, and allow it to settle; the mucous part will fall entirely to the bottom, and the pure oil will swim at top, perfectly transparent while hot, but when it cools it becomes opaque, assumes a color somewhat paler than the original butter before it was melted, and a firmer consistence, more nearly resembling that of tallow, and consequently it will better resist the heat of a warm climate than butter itself. When this refined butter is become a little stiff, and while it still is somewhat soft, the pure part should be seperated from the dregs, and then salted, and packed up in the same way as is directed for butter. This would retain the salt longer and keep much longer sweet, in hot climates, than if it had been cured in its original state.

This refined butter may be preserved in yet another way, which I have sometimes seen practised here by way of medicinal *bonne bouche* (comfit.) After the butter is purified, add to it a certain proportion of firm honey, mix it well; it will incorporate thoroughly with the butter, and when cold, it eats very pleasantly spread on bread like butter; and may be given to old people, if they relish it, instead of marrow, and to others as being useful for coughs and colds. These were the uses to which I have seen this substance applied, and on these occasions the proportion of honey employed was considerable. I have seen it kept for years, without maifesting the smallest tendency to rancidity, so that there can be no doubt but that butter might thus be preserved in long voyages without spoiling. The only point that remains to be ascertained is, what is the smallest proportion of honey that would be sufficient to preserve the butter. Sugar is known to be a much more powerful antiseptic than common salt, and probably honey may be in that respect nearly on a par with sugar. If so, it would be reasonoble to suppose that one ounce of honey might be sufficient to preserve sixteen ounces of butter. In that case the taste of the honey would not be extremely perceptible, so that the butter, even to those who might not relish the sweet composition above mentioned, might prove very agreeable, especially if a little salt were mixed with it when about to be used. A few experiments would be sufficient to ascertain this particular.

From the circumstance of the honey incorporating with the butter, and not separating from it in a fluid state, it would promise nearly to accomplish the purpose wanted above. Whether, when it became very fluid, and was long continued in that state, any separation would take place; or whether the honey in such circumstances would be in danger of fermenting, are questions that experience alone can determine. Sugar, though it would preserve the butter equally well while it continued in a solid state, would doubtless separate from it when it became fluid. Whether molasses would do so, or what effects they would in this case produce, I cannot tell; but a few experiments would ascertain these points. Should any method of preserving butter in warm climates be discovered, it would be productive of so many benefits to individuals, and to the nation at large, by giving an opening for a new branch of commerce and and manufacture, that it is much to be wished the few experiments wanted to ascertain these points were made, with such care, under the direction of persons who would faithfully report the result to the public, as should be sufficient to remove all doubts upon this head.

P. S. The greatest part of the observations contained in the foregoing pages, were derived from a lady, who is now beyond the reach of being affected by any thing in this sublunary world. Her beneficence of disposition induced her never to overlook any fact or circumstance that fell within the sphere of her observation, which promised to be in any reepect beneficial to her fellow creatures. To her gentle influence the public are indebted, if they be indeed indebted at all, for whatever useful hints may at any time have dropped from my pen. A being, she thought, who must depend so much as man does, on the assistence of others, owes as a debt to his fellow creatures, the communications of the little useful knowledge that chance may have thrown in his way. Such has been my constant aim: such were the views of the wife of my bosom—the friend of my heart, who supported and assisted me in all my pursuits. I now feel a melancholy satisfaction in contemplating those objects she once delighted to elucidate.

FAT MUTTON—SUGAR-BEET.

From the Farmers' Cabinet.

It is to be regretted that so little attention is paid to the proper sheltering of cattle in this country. One would naturally suppose that the interests of owners would point out a proper course; and that once systematized, and the advantages of strictly attending to the comfort and convenience of our cattle made manifest, even to the most skeptical, that whole neighborhoods would adopt the system, and that, in a resonable length of time, it would, very extensively, if not universally, prevail. It is lamentable to say that this is *not* the case. For some reason or other, which I have not as yet been able to ascertain, improvements make but slow advances among our farmers. It may be, that they consider improvements as innovations in those customs which have "grown with their growth." Some, with the evidence before their eyes, evidence which they cannot possibly resist or gainsay, refuse to profit by the experience of others. I have several cases in point, one of which I will note. For a number of years I have been in the habit of attending the Philadelphia market, principally with mutton, and as I always personally superintended my sheep and other animals on the farm, and saw that they were regularly and sufficiently fed, I generally brought meat which I was not ashamed of, and which by its good quality recommended itself to purchasers, insomuch that I had no difficulty in securing a regular set of good customers, who cheerfully paid a fair price for a good article. Some of my neighbors attended the same market —but as I generally sold out first, they thought I was "uncommonly lucky." Four years since I obtained a quantity of the seed of the French sugar beet, and put in an acre by way of experiment not in the way of making *sugar*, but the making of *fat*. This first trial fixed me. My cows, sheep and hogs were very fond of them, during the long and severe winter which followed. They all kept in good heart and condition; what surprised me most was the rapid manner in which my sheep, fed on the sugar beet, took on fat; and when carried to market the saddles excited particular attention, from their very superior appearance. But it was not in appearance only; the meat was of a much better quality, more juicy, and exceedingly tender. The inquiry was, "why, sir, on what do you fatten your sheep?" And when I replied, on the sugar beet, hay, and a small portion of corn, it would generally call forth an exclamation of surprise. Ever since I have been a grower of sugar beet, the meat I take to market is always in demand, and brings several cents more per pound than that fattened in the old way; and yet, strange to say, some of my neighbors, although I have urged them, will not plant the beet for their stock. I have been benefited to the extent of several hundred dollars by the introduction of this root—the effects are visible—my neighbors know it—and yet they stand lookers on, halting between two opinions. But light is breaking in upon us, and of one thing you may be assured, that is, that the time is not far distant *when every extensive stock feeder will be an extensive root grower.*

To the delinquents, and there are many in my vicinity, I would say, "rouse ye from your lethargy, and although for the present season you have lost the advantage of planting the sugar beet and the mangel wurtzel, yet you may in some measure atone for your past neglect, by putting in immediately a sufficient quantity of ruta baga. You have time enough for this, but none to lose. The ruta baga is an excellent root—plant it liberally—cultivate it thoroughly—and you will find your account in it in more ways than one, if you are spared until the ensuing winter. Depend upon it, there is nothing better for cattle than roots, properly prepared. I put in some of almost all kinds; and I find carrots answer well for a change. But with me the sugar beet is superior to all others. My way of feeding is simple. When the cattle are housed they are kept constantly furnished with good hay, have roots three times a day, with an occasional change to corn or cut feed. I find great benefit from currying my cows—indeed, it seems to me as necessary to curry a cow as a horse—and if any one will make the experiment, as I did on two oxen, it will remove every doubt. They were both put up at the same time—fed precisely alike—and the treatment throughout was similar in every respect, except in the use of the curry comb, and the ox on which it was used was in *reality*, as well as in appearance, six per cent. better than his fellow. The cause of this must be apparent to every reflecting mind. N. I.

Delaware county, May 18th, 1839.

FREE MARTINS.

From the Genesee Farmer.

When a cow has twin calves, one a bull calf and the other to appearance a heifer calf, the last is called a *free martin*. It is a singular law of nature, and apparently limited to cattle, that twin animals so produced, are unfit for the propagation of their species. The free martin is to appearance a cow, exhibits at times sexual inclinations, and some have been known to receive the male, but always without effect. These singular facts led Dr. Hunter to a physiological examination of their structure; and recently Dr. Allnatt, of London, has examined several with the same object. The cause of this singular animal phenomenon, is found to result from a peculiar vaginal and uterine organization, which effectually prevents conception. The expulsion of the urine was, in the animal examined by Dr. A., propelled in jets rather than a continued stream, and a singular malconformation of the parts, on examination after death, satisfactorily explained the cause. Free martins work well in the yoke, are strong and kind workers together, or with another ox. When allowed to run with the cows, the free martin, unlike the spayed heifer, is particularly on the alert, when the cows are in a condition to receive the male. Why the female of the ox family, when produced as a twin, should alone of all other animals be incapable of reproduction, is one of those physiological anomalies left for future observers to explain.

CORRESPONDENCE ON THE INTRODUCTION OF TROPICAL PLANTS.

[Communicated for publication in the Farmers' Register.]

To the Honorable the Secretary of the Navy of the U. S. A. at Washington, D. C.

Indian Key, T. Fl., April 22, 1839.

Sir—The subscribing trustees of the Tropical Plant Company have the honor to inform the Hon. Secretary of the Navy that near the celebrated pits of water on lower Matacumba, they have now established a preparatory nursery of tropical plants, in which they are ready and willing to receive and preserve all valuable plants that may be brought by our naval vessels under the treasury and navy circulars of the 6th of September, 1827. It may be added that the site of the nursery is about one mile west of Indian Key; and that vessels drawing eighteen feet of water may easily enter and safely anchor within the Reef at a distance of three miles at the most, from said nursery. In relation to *fibrous leaved* plants for the special use of the navy itself, it is respectfully suggested that during the actual hostilities of France with Mexico a precious cargo of living plants may now be extracted from the latter country without that embarrassing opposition from the Mexican authorities which may be expected at all other times, even by our armed vessels, from Creole animosity to foreign enterprise; and that it is especially important to obtain this summer from Sisal, in Yucatan, and from Goazacoaleos, in Vera Cruz, as many *suckers* as possible of the Agave Sisalana and Bromelia Pita; because it is now *demonstrated* that these superior substitutes for hemp and flax can be readily propagated over the *arid* islands and coasts of Tropical Florida by the *success* of the few plants sent to Cape Florida in 1833 by the American Consul at Campeachy. As, however, the greatest portion of southern Florida consists of *marshy* grounds which are adapted to the vigorous growth of succulent plants of the Banana family, called Musaceæ, and as their offspring arrive at maturity in a single year, (or one-third of the time requisite for the fleshy-leaved Agaves,) it is so much the more desirable to obtain speedily a considerable number of the *Manilla hemp bananas*, called *musa abaca* and *musa textilis* by botanists; and hence the department is respectfully reminded that these incalculably important plants were carried to French Cayenne for the French government, by the same Mons. Perrottet, who at the same time transported to the same places the highly celebrated morus multicaulis from the same Philippine islands; and that hence their fibrous stalked progeny may be early obtained and speedily transported to the hitherto unprofitable marshes of Florida. For many details concerning the fibrous leaved and fibrous stalked plants which yield the foliaceous and petiolar fibres, called Sisal hemp, Manilla hemp, grass hemp, grass flax, vegetable silk, &c.; the department is respectfully referred to communications on file in its own archives from the former consul at Campeachy; and to the articles and plates on the same subjects in the reports of the committees on agriculture of congress which accompanied the bill, become a law, "to encourage the introduction and promote the cultivation of tropical plants in the United States." We have the honor to be, sir,

Very respectfully, your very humble,
And obedient servants,
(Signed) Charles Howe,
Henry Perrine.
Trustees T. P. C.

Navy Department, 5th June, 1839.

Gentlemen—Your interesting communication of the 22nd of April last has been received. The department will avail itself when practicable, of your offer to receive and preserve such tropical plants as may be imported into the United States by our public vessels, under the circular of the 6th of September, 1827, to which you make reference.

Hostilities between France and Mexico having ceased, it is now too late to improve your suggestion of the facilities presented by a state of war between those countries, for the importation, this season, of the fibrous plants mentioned in your letter; but the subject will be borne in mind for future action, when circumstances will admit of it.

Wishing you entire success in the laudable and important enterprise in which you have embarked.

I am, very respectfully,
Your obedient servant,
J. K. Paulding.

H. Perrine &
Chas. Howe, esq's.
Indian Key, Florida,

HARVESTING CORN IN OHIO.

From the Genesee Farmer.

Mr. Editor—As things that come from a distance, are generally esteemed more valuable than those produced at home, I shall venture to give our western method of cutting up corn, and let you manufacture it into what you like.

My plan is to put 120 hills in one shock; others put 144. I commence cutting two rows, advance ten hills, and then stop and tie four hills in the rows, I am cutting, in this manner, +. Then advance, cutting both rows laying five or six hills in a parcel, until I have advanced ten hills ahead; then stop and tie as before, and this makes twelve hills to a shock this way. I then count off eight rows, and commence on two more; then I proceed through the field, or lot intended to be cut. I then put up what is cut up between those hills, having their tops united in as even a manner as I can; set it as nearly upright as possible, placing the buts well on the ground, and in such a manner as to form a neat circle. The corn by this time is generally partially cured, so that I take a stalk or wisp of straw and tie the tops at a suitable height and distance. It is best to let this stand a day or two, in order that it may properly cure. After going through in this order, I commence and cut four rows to each row of shocks, two rows on either side, letting it cure as much as possible, but be sure to have it well set up before rain falls upon it. I prefer letting it stand a day or two in this state, as I have seen it mould some, if the weather should be damp. Then proceed with the remaining four rows in like manner, when each shock shall have received its due portion of 120 hills, be particular to set it upright and even around the centre, and the buts well settled on the ground. Now after the shocks have stood a day or two let two hands go carefully over the whole, righting every shock and stalk that may be out of place, and at the same time firmly tying each and every shock at a reasonable distance from the top with a band made of rye straw, or made by taking four stalks; take off the ears, let each man take two, roll the blades around the stalks from but to top, then let them unite these by crossing their tops and breaking back the tops of each pair towards the but, and inserting the tops between the stalks. Last year I put up about 12 acres in the above manner, a great part of which stood out until May, and better or sweeter corn I never had, than I now have; I think not more than two or three shocks fell so as to take damage. S. T.

Jefferson, Preble Co. Ohio, June 12, 1839.

REPLY TO CHARGES IN DR. PERRINE'S COMMUNICATION.

To the Editor of the Farmers' Register.

Pensacola, July 19th, 1839.

Sir—Your register of June, has an article from Dr. Perrine, of Indian Key, in which are misrepresentations of my conduct. Dr. Perrine showed me a circular from the Hon. Sec. of War, directing all officers on the coast to assist him in his plans as far as possible without detriment to *public service;* at the same time making me a request to procure any mulberry plants that I could find on the mainland and bring them to Indian Key. I soon after went on an expedition, but did not see any of the morus multicaulis. He also made the same request to Capt. H. Brown, the pilot of my vessel, whose certificate I have obtained. His assertion of my being a partizan of Indian Key is [incorrect.] I never myself disturbed a single mulberry plant, and but one was ever taken up by any person under my command.

Very respectfully,
Your obedient servant,
EDMUND T. SHUBRICK.
Act. Lieut. U. S. N.

[*Certificate.*]

Dr. Perrine requested me at Indian Key to procure him some mulberry plants from Dubose's place at the Miami river. Having met a good many which I took to be the morus multicaulis, I pulled up one to take as a specimen, and which I planted at Soldier Key to preserve it until we next went to Indian Key—and which I did without either the order or knowledge of Lieut. Shubrick. Immediately on our arrival at Indian Key, I informed Dr. Perrine of my having done this. The plant was by accident left. This is what Dr. Perrine terms my confession of having pulled up some large leaved mulberry plants.

HENRY BROWN.

Sir—I request that you will do me the justice to publish this in your next number.

EDMUND T. SHUBRICK.
Act. Lieut. U. S. N.

MILLET.

It is stated in a work on agriculture, that a gentleman in Pennsylvania sowed a peck to the acre the last of May—sowed four acres—cut middle of August, and suffered to dry in the sun for two or three days—produce 75 bushels of seed and one and a half tons of fodder to the acre. Cattle relish it. The produce per acre is frequently much greater than stated above. It is often cut in the milk. It is first sown in drills about three feet apart, and the plants should stand six inches from each other in the rows after hoeing. In this latitude (New Jersey) it may be sown from the middle of May to the 20th of June.—*Corr. Farmer's Cabinet.*

SUCKERING INDIAN CORN.

From the New England Farmer.

The question is repeatedly proposed, is it best to sucker our corn? We believe as a general rule that no growing plant can be mutilated or stripped of its crown, its limbs, or its leaves, without injury; or at least that it cannot be safely done before the seed is completely formed. There are exceptions to this at least of a qualified nature, as where a melon vine is stopped or a grape vine girdled with a view of forwarding the ripening of the fruit. The suckers of corn are of course not so important to the plant as the stalks; and the fodder obtained by removing them will be some equivalent for the labor expended in the operation. But upon the whole we hesitate in advising to it. We once suckered a large field. The growth was most extraordinarily luxuriant and heavy; and a great deal of the corn was broken down by the process. We did not accurately measure the crop, which some accidental circumstances prevented our doing; but as well as we could judge, the amount of produce was not increased, and the whole field was materially injured. We know a careful farmer in Middlesex county, who operating on a small scale and with his own hands, in a case too where the field is so small that he finds no difficulty in carrying out his suckers, who believes that he has derived some small advantage from it. The Rev. Dr. Lyman, of Hatfield, gave to the Massachusetts Society an account of an experiment performed by him, of suckering a considerable field some years since. We have not seen the account for a long time; but as well as we can remember, he regarded the increase of the produce or the saving of the fodder from the suckers as not a compensation for the trouble and the injury to the corn. The fodder from the suckers is not lost if left standing until the whole is gathered. The judgment of Lorain, whose authority in all matters pertaining to agriculture will not be questioned, is against suckering corn, or cutting the stalks until the crop is fully ripened.

In the southern states the leaves of Indian corn are stripped off for the winter fodder of their horses, and as their only practicable substitute for hay. We wish some intelligent southern cultivator, as our respected friend Ruffin, of the Farmers' Register, if this should meet his eye, or the intelligent editor of the Southern Agriculturist, would give us their views on this subject and inform us of any satisfactory experiments which may have been made to test the advantages or the injury of the practice. If opportunity presents, we shall advert to the matter of topping stalks and gathering the crop hereafter; old matters indeed, and on which we have nothing novel to recommend, but in respect to which it may be useful to call to recollection some decisive and instructive experiments which have been made. H. C.

NATURAL HISTORY AND ECONOMY OF THE HONEY BEE.

From the Edinburgh Encyclopædia.

The honey bee is either wild or domesticated, and consists of numerous societies, composed of from 10,000 to 30,000, perhaps 40,000 or 50,000 individuals. In the former state, it inhabits the woods, in clefts of trees, and, it may be, the cavities of rocks also; in the latter, it is kept by us in wooden boxes, or coverings of straw or osiers, commonly called *hives* in English, but more definitely *skeps* in the Scottish language, or old English: for, strictly speaking, *hive* signifies the covering and its colony; and *swarm*, that portion of the bees which leaves the parent stock at a certain season of the year, before it is lodged under our care. Each hive, by which we understand the whole colony, contains three different kinds of bees; females, males, and workers. The females, of which not more than one can ever live in all the great population of a hive, are called *queens;* the males, of which there are hundreds, and sometimes thousands, are called *drones;* and the remainder are denominated *workers*, or *neuters*, from being supposed to belong to neither sex. They are the operative part of the community; for, while the female gives birth to the whole young, and the males perform no functions but perpetuating their race, the workers collect the honey, form the wax, build the combs, watch over the growth of the young, and supply their necessities.

We shall not dwell on the anatomy of the bee, concerning which Swammerdam and Reaumur have so largely written; but the use to which the animal can convert some of its organs, requires a brief explanation of their structure. A bee has four wings and six legs: its abdomen consists of several scaly circular rings, connected by membranes; the last is armed with a sting: and the head is provided with a proboscis, and two mandibles, in addition to a real mouth, which the animal has likewise. The body is totally covered with hair, which is not to be considered an indifferent character; for each separate hair, viewed with a microscope, appears a plant in miniature, with a stem and branches; and the small particles of pollen, shaken off by the motion of a bee in a flower, are arrested by the hairs, and then collected into pellets with its limbs. In the third pair of these limbs is a small hollow, to which the pellets are fixed; and part of the second pair is provided with what resemble brushes, for brushing off the pollen. The proboscis is the principal organ employed in collecting the honey; when inactive, it is folded under the head, and defended by a scaly sheath, or covering. When employed, it is extended, and the animal apparently licks the honey from the flower into its mouth, which is of considerable size, and thence transmits it to the stomach. All the honey which we see in combs is a vegetable product. After being swallowed by the bees, it is disgorged into their cells; but its scanty quantities in the natural state prevent us from ascertaining what change is undergone in the stomach. Until very lately, it was believed that the bees also swallowed the wax, and disgorged it to construct the cells; and, when so disgorged, that it had the property of indurating, like the substance forming silk, immediately on exposure to the air; and that the mandibles were used in moulding the parts to their proper size and thickness. It is now proved, that wax is made out of honey, which is swallowed by the bees indeed, but there is great reason to believe that it then transudes through the membranes connecting the rings of the body in the form of wax. The females and workers have a sting, of which the males are destitute. This is not a simple sharp-pointed weapon, as apparent to the eye of a superficial observer; it consists of two separate portions, applied longitudinally against each other. The external side of each is provided with several barbs, like those of a dart, which prevents the retraction of the sting from the wound it has inflicted, until the purpose of its penetration, the discharge of poison, be fulfilled. These barbs, it is said, may be elevated and depressed at the will of the animal. Having satisfied its vengeance, the sting is withdrawn; but if the bee is suddenly forced away, the barbs remain elevated, and retain the sting in the wound. The extraordinary pain attending so small a puncture, arises from a liquid, which is genuine poison, flowing into the wound from an oval bag, or reservoir, in the body of the animal, connected with the sting; and its virulence is such, as even to accasion death, if the stings be numerous. In experiments where a small portion of the poison was introduced into a slight puncture with the point of a pin, acute pain followed; and, on laying the smallest quantity on the tongue, a sweetish tase first was sensible, which became burning and acrid, and continued so several hours. The effect of the poison is various on different people; in some, a single sting occasions violent swelling and inflammation; others suffer little inconvenience from it. If the sting be left in the wound, its vital powers will force it still deeper; therefore it is cautiously to be extracted, and the part sucked and washed with vinegar, or some liquid fit to allay inflammation, that being probably the only effectual mode of cure. We cannot readily ascertain the real use of the sting to bees. It is vain to affirm, that it is an organ of defence against enemies; that the treasurers of a hive are particularly exposed to depredation, and require great protection. Many other insects, in similar circumstances, have no defensive weapon; many possess it which we can hardly say have any thing to guard; and some, exposed to numerous accidents, are entirely unprovided with the means of averting them. The sole purposes to which we see the sting applied, independent of the resistance of injury, are massacreing the drones of the hive; and by queens, to effect their mutual destruction. Queens are more pacific than the common bees, and less inclined to sting the person that handles them.

The three kinds of bees inhabiting a hive are all of different size and appearance, and may easily be recognized. The common bees and males are familiar to every one; the latter being much larger, and of duller flight. But the queen resembles neither in structure; she is about eight lines and a half in length, while the males are seven, and the workers six. Her abdomen is greatly longer in proportion, and increases much when filled with eggs; her wings are so short as scarcely to reach past the third ring, and her color tends to a deeper yellow. Queens, and also males, are occasionally seen of smaller size than usual; which naturalists have supposed is owing to accidental circumstances. It is not yet known, however, whether all the bees preserved in hives, in different countries, are exactly of the same species; or, whether there are varieties preserving their peculiar characteristics of size and color.

Long ago it was ascertained, that the welfare of the queen is indispensable to the welfare of the hive, and that any accident befalling her, is fatal to the whole colony. As she is the parent of the hive, it is from her alone that a complete swarm, composed of queens, drones, and workers, can proceed; and without all these different members of the community, it cannot either lay up stores, or be preserved in existence. That bees are propagated by means of eggs, which are hatched into worms, could not be unknown from times of the most remote antiquity; but no point in the natural history of animals has been more keenly contested, than their precise mode of generation. It was concluded, from finding males and females together in the same hive, that their sexule union gave birth to the young; yet no one had beheld their concourse. Those provided with the means best adapted for observation, could only assert, that something like an indistinct and transient junction had taken place before them. Others, again, with with all the assiduity, care, and attention they were able to command, could see nothing of the kind; and thence inferred, that the queen was a real hermaphrodite, which in itself possessed the generative powers of both sexes combined. A third class, where we are surprised the name of Swammerdam should appear, ascribed the impregnation of the queen to a certain *aura* emanating from the bodies of the males, which must necessarily be numerous, in order that it may have sufficient power; and a few observers conceived, that external fecundation of the eggs took place after being deposited in the cell, in the same way as the generation of frogs and fishes is effected. But, on the other hand, young were found in hives provided with queens, though entirely destitute of males. They were seen in spring long before males begin to exist, and in winter after the whole are destroyed; and an experiment by Hattorf evinced the aversion of queen to drones, rather than an affection for them. He took two virgin queens from their cells, and confined each, along with two drones taken from the same hive, under a glass vessel. One of the drones having approached a queen, was seized by her, and killed on the spot; and the other did exactly alike with one of her companions; the two remaining drones escaped. This experiment, on frequent repetition presented similar results; and the variety of devices to ascertain the fact, were attended with consequences which served still more and more to perplex the observer. At length, however, the truth seems to be disclosed, and we shall briefly advert to the methods adopted for the purpose of discovering it.

M. Huber of Geneva, one of the most intelligent authors who have written on this subject, finding the experiments of all former naturalists unsatisfactory, removed the whole reigning females from a number of hives, and substituted for each a queen taken at the moment she came to maturity. He then divided the hives into two classes; and have removed all the drones from those of the first class, he adapted a glass tube to the entrance so narrow that no drone could pass, but large enough to admit common bees. The whole drones were allowed to remain in the hives of the second class, and more were even introduced. A glass tube, also, too small for their exit, though of sufficient capacity for common bees, was likewise adapted to the entrance of the hives. This experiment was carefully made; and, to the author's great surprise, all the queens remained steril; thus proving, that a female confined to her hive would continue barren while amidst a seraglio of males.

The result of successive experiments, diversified in every possible manner, and made with much skill and indefatigable labor, proved, that the generation of bees is effected by the union of the sexes, as in most other species of insects, and the larger terrestrial animals. But it is never in the interior of the hive that it takes place. The queen, to accomplish it, must issue forth from her dwelling—the only occasion, except one, on which she leaves it; and although her junction with the drone has not yet been witnessed by human eyes, it is supposed to happen high in the air. In illustrating the generation of bees, the author whom we have already named concluded, that if queens were obliged to go out for impregnation, it would be at the warmest time of the day, as the males then leave the hive. On the 29th of June, a *hive*, containing a virgin queen five days old, was made the subject of observation. The sun had shone from his rising; the air was very warm; *and*, at eleven in the forenoon, the males began to leave the neighboring hives. The entrance of the one containing the queen was then enlarged, and the bees entering and departing narrowly observed. The males appeared, and immediately took flight; and soon afterwards the young queen came to the entrance. Before quitting the board, she traversed it, and brushed her belly with her hind legs, during which she received no attention either from the males or workers. Taking flight, she again approached the hive, as if to examine the place of her departure, that she might recognize it. Next, describing circles ten or twelve feet above the surface of the earth, she rapidly rose *in the* air, and was soon out of sight. The observer and an assistant hastened to contract the entrance of the hive, and in seven minutes the young queen returned. No external marks of fecundation being visible, she was allowed to enter the hive. In a quarter of an hour she came to the entrance, and brushing herself as before, took flight. Returning to examine the hive, she departed, rising so high that the observers soon lost sight of her. Twenty-seven minutes elapsed before her second excursion terminated; but now she was in a very different condition from that in which she appeared after the first; for she exhibited the most unequivocal evidence of sexual union, by bringing along with her the genital organs of the male by which she had been impregnated. And here a wonderful deviation from the ordinary laws of nature ensues; the male loses his organs in copulation, and thus sacrifices his own life in perpetuating his race. In two days the belly of the queen was swollen; and, on investigation, she proved to have laid nearly an hundred eggs in the workers' cells. For some reason, which is unknown to us, the sexual union cannot be accomplished in the hive; and the object of the queen's departure being once fulfilled, she never again leaves it unless to conduct a swarm.

Forty-six hours after impregnation the queen begins laying eggs, which will become workers; and, provided impregnation takes place within the first twenty days of her existence, thousands are produced uninterruptedly during the succeeding eleven months. Then she commences laying eggs which will be drones. But should matters be otherwise arranged; should her impregnation, either from constraint or accident, be delayed more than twenty days beyond her own complete metamorphosis, a singular alteration takes place. She begins laying within forty-six hours of its occurrence, but no eggs excepting those from which drones proceed; nor will she lay any other kind during her whole life. A nice and difficult problem thence arises, which analogy does not aid us to solve. How is the order of nature so completely inverted by retarded impregnation? The eggs producing males require, in the natural state, eleven months to attain maturity; but, under the effects of this accidental occurrence, they reach perfection in forty-six hours. Those eggs which should have preceded them, during eleven months, in many thousands, totally disappear, and from no other sensible cause. Some vitiation has ensued, which, while it destroys the vitality of which the workers' eggs are susceptible, operates such a change, as to bring those of the males eleven months earlier to maturity. On reflecting that a simple copulation is sufficient to impregnate all the eggs which a queen will lay in two years, or, perhaps, the whole that she will lay during her life, the question becomes still more embarrassing. Without being aware of the cause of such peculiarities, some observers have maintained, that there were certain species of queens, from which no description of bees, excepting drones, would be generated; which they justly determined was extremely injurious to their respective colonies.

The laying of a queen is retarded, or altogether interrupted, by cold; and one impregnated in the end of October has been known to retain her eggs four months and a half, owing to the intervention of winter. This queen, during March and April, laid above 3000 eggs, producing males only; and so very prolific are these insects, that a single queen may be the mother of 12,000 bees, or more, in the space of two months, which is laying at the rate of 200 eggs daily. The queen before depositing an egg, examines whether the cell is clean and fit to receive it, and also suitable to its future state; for queens, males, and workers, have cells peculiarly adapted to their kind, and the queen, by anticipation, seems aware which of these will proceed from the egg she deposites. Those producing workers are deposited in common horizontal cells; but the cells containing the eggs which will be transformed into queens are large and rudely constructed, with a great quantity of wax, and hang perpendicularly in the hive. When the egg is laid, the bees supply the cell with the pollen of flowers, which serves to feed the young worm coming from it.

The eggs of all the three kinds of bees are hatched in three days; a fact apparently of trifling import, but which it is essential for the cultivator to learn. A worker then remains five days in the vermicular state; a male six and a half; and a queen five. The workers' worm occupies thirty-six hours in spinning its silken envelope or cocoon; in three days it changes to a nymph; and only on the twentieth day of its existence does it become a complete or perfect winged animal. The drones are still longer of attaining their last metamorphosis, which succeeds in twenty-four days after the egg has been laid. But the queen comes to perfection in sixteen days.

Food is carried by the bees to the worms as they require it: but when ready to transfrom to a nymph, they are aware that it is no longer necessary; on the contrary, the mouth of the cell is sealed with a covering of wax formed of concentric circles from the edge, convex if including males, and flat if including workers. The same cell may successively bring different workers to maturity: after one has left it, the bees clean the inside, and the mother again lays there; but the cells containing eggs which become queens are used no more than once. When the perfect insect escapes, the cell is usually destroyed.

While treating of the origin and imperfect state of bees, we cannot omit observing, that although, generally speaking, the queen is the parent of the whole, yet there are some workers, (at least some bees so much resembling workers, that there is no perceptible difference,) which lay eggs. Their ovaries are smaller, more fragile, and composed of fewer oviducts than those of queens; and the eggs, like the eggs of queens whose fecundation has been retarded, produce male bees only, and neither queens nor workers. This singular fact, added to another not less so, on which we shall immediately make a few remarks, strongly tends to establish, that all working bees are originally of the female sex; and that in the ordinary case their ovaries are vitiated, and become unfit for laying any eggs except those transforming to males.

M. Schirach, an eminent naturalist, discovered, that in certain circumstances the animal destined to become a worker could actually be converted into a queen; and that this conversion was in the power of the bees, by means of a particular mode of treatment bestowed on the worm while in an early stage. He thence concluded, that every queen is originally a worker, which, without the particular treatment administered, would have remained a worker, but having undergone this treatment, it is converted to a queen; and that the bees, to attain the conversion, selected the worm when three days old. Nevertheless it is indubitable, that specific eggs are laid in royal cells and hatched into queens, which, according to the most credible and satisfactory experiments, never would have produced workers. It is surely to avoid the fatal consequences which would attend twenty or thirty thousand animals on the loss of a single life, that they have been endowed with such uncommon prerogatives.

Immediately on the loss or removal of a queen, the whole hive is a scene of tumult and disorder: the bees seem to anticipate their own destruction, by the precaution they take to guard against it. Should there be neither eggs nor brood in the combs, they will infallibly perish; their instinctive faculties are lost, they have no object for which their labors are united, they cease to collect honey and prepare wax, and in a short time they disappear and die. But if there be brood in the combs, the industry of the bees continues unabated; for by the proceeding which they follow, they know that their loss will be repaired. Having selected a worm three days old or less, they sacrifice three of the contiguous cells, that the cell of the worm may be formed into one adapted to breed a queen. They next supply it with the necessary food, which is not the common farina, pollen, or bee-bread, on which the young of workers feed, but a peculiar kind of paste or jelly, of a pungent taste, which is reserved for queens alone. A cylindrical enclosure is raised around the worm, whereby its cell becomes a perfect tube with its original rhomboidal bottom; for that part remains untouched. Were it injured, the fabric of the other three cells on the opposite side of comb would be deranged, which would be a needless waste. The cell is still horizontal like the rest in the combs, and thus remains during the first three days of the existence of the worm; but the bees in prosecuting its enlargement, alter its direction, and form it to hang perpendicularly, as all those cells do which have been inhabited by queens. In performing this essential part of the operation, they do not scruple to destroy the worms surrounding the tube, and use the wax of their cells in constructing the new part, which they appply at right angles to the first, and work downwards. The cell is then of a pyramidal figure, usually near the edges of the combs; it insensibly decreases from the base, and is closed at the top when the included worm is ready to undergo its transformation to a nymph. When reaching maturity, the seal is broken, and a queen comes forth qualified to fulfil every indispensible function on which the preservation of so many thousand lives depends. Working bees have therefore the power of effecting the metamorphosis of one of their own species, to avert the effects of a loss which would prove the utter ruin of the whole colony.

A question extremely abstruse, and difficult in the physiology of animated existence, here presents itself. Whence does it happen that bees are susceptible of so great a change? and that an animal naturally steril, and possessing certain definite habits and properties, which it is death to interrupt or alter, should be converted into a creature of different figure, uncommon fertility, and endowed with instincts bearing little or no resemblance in the one state compared with the other? Some naturalists have endeavored to seek the cause of this singular fact in the food with which the larva is supplied in its cell. That food, they affirm, is not the same as what is given to the young of common bees, as may easily be discovered by its taste and consistency. It possesses a certain quality which affects the organization of the insect, it enlarges the size, expands the ovaries, and operates the whole alteration. By similar reasoning they endeavor to explain the cause of that fertility, which is at times, though rarely, seen in workers. These workers they suppose to have inhabited cells in the immediate vicinity of royal cells, during the earlier part of their own existence. Particles of the food appropriated for queens having accidentally fallen among what was destined for the common worms, produces a partial change in particular organs; though under its influence the ovaries are but imperfectly expanded, and also labor under a vicious conformation, which unfits them from propagating any eggs excepting those transforming to drones. We cannot subscribe to these doctrines, which proceed from the most intelligent noturalists of the present age, because they are unsupported by experiment. The subject is to us still wrapt in mystery; nor is it to be aided by any fact with which we are acquainted in the generation of animals. Perhaps it affords some reason for believing, that the germs of all animals are of one sex only, it may be of no sex, but possessing organs susceptible, in certain cases, of a different kind of evolution. We are indebted to Schirach for the original discovery of this property enjoyed by bees, which has subsequently been confirmed by other observers.

These being the imperfect stages which bees undergo, and their ultimate transformation being completed, three different kinds, females, males, and workers, whose offices, nature, and properties, are also different from those of each other, inhabit the same swarm. In common with other insects, they are of a lighter color at the moment of issuing from the cells, and totally covered with hair, which is less abundant on the queen. The quantity of it seems to diminish with their age: it is not known how long they survive, but most probably above one or two years, or considerably more. The queens and drones of smaller size, sometimes found in hives, are regarded as aberrations from the general race. Their nature has not hitherto been fully illustrated; but naturalists have ascribed this diminution to the eggs producing them having accidentally been laid in wrong cells: that their organs are there cramped and confined, and prevented from attaining their due expansion from the smallness of the cell. At the same time, though the eggs producing workers are laid in cells of greater than ordinary size, the reverse does not ensue, and the body is still restrained to its natural dimensions. Schirach obscurely hints his opinion, that the greater length of the queen is owing to the greater length of her cell.

We shall next explain the peculiar office and functions of each species of bees, the queens, drones, and workers, in their perfect state, and show the mutual relation that must subsist among them, in order to ensure the welfare of the community. In the history of other insects nothing more is taken into consideration than a general view of the structure, habits, and perpetuation of the race. But in treating of bees, we have not only to enter on the origin of each variety in a hive, to follow it through its successive stages until gaining perfection, to examine that internal œconomy which the instinct of many thousand individuals regulates; but we have to show the cultivator, who designs converting their labors to advantage, how their nature operates separately as well as combined.

The sole functions of the queen bee are to perpetuate her species; but single and unassisted by the workers, herself and her offspring would perish. Her fecundity is surprising. Swammerdam affirms, that she contains 50,000 eggs; and some authors advance, that she may be the mother of 100,000 bees in one season. In addition to the peculiarities exhibited in her propagating young, she is marked by others of the most conspicuous description. She is watched and attended to; and, to judge from appearances, sheltered and respected by the workers. Groups of them constantly encircle her; they supply her with honey, brush and lick her limbs; whenever she moves, they recede before her; and, according to the united sentiments of all who have studied the nature of bees, pay her what would be called real homage, could we allow them the prerogative of understanding. She is an object of the greatest attachment; her presence inspires them with new instincts, and animates them to labor: the permanent existence of a queen, in short, is the only security of the workers. Excepting when she leaves the hive for fecundation, they cluster around her; and hence some persons have endeavored to impose on the credulous, as having a command or power over bees. It is true that such persons could make a whole swarm follow them from place to place without injury to themselves or the spectator; but the sole secret consisted in their having obtained possession of the queen. The natives of foreign countries are acquainted with this attachment of the workers to their queen, which some years since was exhibited in Britain under mysterious disguise, as Labat, long ago, relates in his Travels. He received a visit from a man who called himself *master of the bees.* "It is certain they followed him as sheep do their shepherd, and even more closely. His cap in particular was covered in such a manner, that it exactly resembled those swarms which, in endeavoring to settle, fix on some branch of a tree. Being desired to take it off, he did so, whereupon the bees settled on his shoulders, his head and his hands, without stinging him or those in the vicinity. All followed him when he retired; for besides those which he carried about, they attended him in legions." People accustomed to handle bees with address, can easily seize the queen, and then, as during swarming, little is to be apprehended from the bees attempting to sting; they are too much occupied in regarding their queen.

Though the queen lays several eggs, which will be successively transformed into queens, only one in its perfect state can exist in a swarm: a plurality seems equally adverse to the intention of nature as a total defect. Hence it follows, that of two coming at the same time into existence, one must die for the welfare of the community. But the charge of accomplishing the destruction of the victim is not confided to the common bees; the queens themselves are entrusted with it. Were it otherwise ordained, dangerous consequences might be the result; for while one group of bees destroyed the first of two queens, another might massacre the second, and the hive being thus deprived of both, would perish. Nature has therefore inspired queens with the most deadly animosity, and the most insatiable thirst for each other's life, which nothing but actual death can appease.

The same intelligent naturalist, M. Huber, to whose authority we frequently recur, gives an interesting account of the combats of queens, part of which we shall abbreviate. In one of his hives fittest for observation, two young queens left their cells almost at the same moment. Whenever they observed each other, they rushed together apparently with great fury, and came into such a position that the antennæ were mutually seized by their fangs. The head, breast, and belly of the one, were opposed to the head, breast, and belly of the other. The extremity of their bodies had only to be curved, that they might be reciprocally pierced with the stings, and both fall dead together. But nature has not decreed that the two combatants should perish in the duel; when in the position now described, they separate, and retreat with the utmost precipitation; and when these rivals felt their extremities about to meet, they disengaged themselves, and each fled away. A few minutes after separating, however, their mutual terror ceased, and they again began to seek each other. Immediately on coming in sight, they again rushed together, seized one another, and resumed exactly their former position. The result of this rencounter was the same; when their bellies approached, they hastily disengaged themselves, and precipitately retreated. During all this time the workers were in great agitation; and the tumult seemed to increase when the adversaries separated. Twice they interrupted the flight of the queens, seized their limbs, and restrained them prisoners about a minute. At last, that queen which was either the strongest or the most enraged, darted on her rival at a moment when unperceived, and with her fangs took hold of the origin of her wing, then rising above her, she curved her own body, and inflicted a mortal wound. She withdrew her sting, and likewise quitted the wing she had seized: the vanquished queen fell down; dragged herself languidly along; and her strength declining, she soon expired. Another experiment, equally interesting, on the mutual antipathy of queens, elucidates the instinct of the common bees, and seems to prove that they are aware of the necessity that such combats should have a fatal issue. M. Huber having painted the thorax of a queen, on purpose that she might be recognized, introduced her into a hive already provided with the natural queen. A circle of bees quickly formed around the stranger, but not to caress or receive her with that grateful homage which a queen is wont to experience; on the contrary, they insensibly accumulated to such a degree, and encompassed her so closely, that scarce a minute elapsed before she lost her liberty, and became a prisoner. By a remarkable concurrence, the workers at the same time collected around the reigning queen; and restrained all her motions: she was instantly confined like the stranger. But as if the bees anticipated the combat in which these queens were about to engage, and were impatient to witness its issue, they retained them prisoners only when preparing to withdraw from each other; and if one less restrained seemed desirous of approaching her rival, all the bees clustering together gave way, to allow her full liberty for the attack: then if the queens testified a disposition to fly, they returned to enclose them. These facts form a singular anomaly in the history of bees. That they take a decided part on the occurrence of such combats, is indubitable; but if they mean to accelerate them, how shall we account for the uncommon care and attention, on every other occasion, bestowed on their queen, be now forgotten, and for their opposing her preparations to avoid impending danger? The cluster of bees that here surrounded the reigning queen having permitted her some freedom, she appeared to advance towards that part of the comb on which her rival stood. All the bees receded before her: the multitude of workers between the adversaries gradually dispersed, until only two remained: these also removed, and allowed the queens to come in sight. At this moment the reigning queen rushed on the stranger, and fixing her against the comb, mortally pierced her body with her sting.

The mutual antipathy manifested by queens, is not limited to their perfect state, for it extends to nymphs yet in the cells. The future existence of a rival, which may dispute her place in the hive, seems to excite apprehension in a queen already come to maturity. The oldest queen in a hive containing five or six royal cells, having undergone her ultimate metamorphosis, hastened, within ten minutes of escaping from her confinement, to visit the cells of the rest still close. She furiously attacted that nearest to her, and, by dint of labor, succeeded in opening the top: then she began tearing the silk of the cocoon; but her efforts being probably inadequate to her purpose, she sought the other end of the cell, where she effected a larger aperture. When of sufficient size, she endeavored to introduce her belly; and after many exertions, succeeded in giving her approaching rival a deadly wound. When she left the cell, the bees, which had hitherto been spectators of her labor, began to enlarge the opening, and drew forth the body of a queen scarcely come from the nymphine state. Meanwhile the victorious young queen attacked another royal cell; but did not endeavor to introduce her sting: it contained only a nymph, and not a perfect queen as the former did. Hence it has been conjectured, that the nymphs of queens inspire less animosity: still they do not escape destruction, for whenever a royal cell is opened before its proper time, the workers extract the contents in whatever form they appear, whether worm, nymph, or queen. Accordingly when the young queen had here abandoned the second cell, the opening which she had made was enlarged by the bees, and they extracted the included nymph. Nymphs of other hives, introduced into one where there is a queen, are equally the subject of animosity. But in this general work of destruction, there is a fact, in the natural history of bees in their earlier stages, elucidated, which we should otherwise find it difficult to explain. The larvæ of the whole three species are endowed with a property widely diffused among insects, that of spinning silk. Each, as we have before observed, spins itself a web or cocoon, in which it reposes a certain time inactive, previous to transformation to the perfect state. The larvæ of workers and males, spin complete cocoons close at both ends; the cocoons of queens are imperfect, covering only the head, thorax, and first ring of the abdomen. Nor can the larvæ do otherwise; the particular form and position of the cell force it to leave the ends of the cocoon open, while in the natural state; but if removed from it, and situated in the same circumstances as the larvæ of males and workers, a complete cocoon is fabricated, in which the animal is fully enveloped. But the purpose of the open cocoon is only now to be discovered; it is, that the enclosed nymph may be exposed, without resistance, to the deadly jealousy of its rivals. Were it close, the sting of the queen, which seems never to be used excepting to destroy her own species, might be entangled in the silk, by which she herself might become the sacrifice, and occasion the loss of the whole hive.

Though only a single female can exist in a swarm, several hundreds, and sometimes thousands, of drones inhabit it. They originate towards the summer season, eleven months after the queen has commenced laying those eggs that become workers, that is, when the propagation of the colony takes place. The sole office of the drones, so far as has yet been discovered, is to fecundate the queen; for we can scarcely admit, as several authors have done, that their heat and custom of crowding on the combs is instrumental in hatching the young brood. Concerning the structure of the genital organs, which are extremely complicated, we shall refer to the works of Swammerdam, Reaumur, and Huber, who have expatiated on it at great length. Drones want a sting; and there is a difference in the conformation of several other parts of the body, as the trunk and antennæ, from those of females and workers. They do not collect honey, but consume it; and instead of entering the cells, as the females and workers do, for repose, they cluster together on the combs. If the sole office of drones be to fecundate the queen, we cannot well account for their numbers. Why should thousands dwell in a hive a burden on the community, when one is enough to perpetuate their race, and when only a single impregnation is required? Naturalists, who have ascribed the fecundation of the queen bee to a certain *aura* emanating from the males, judged it essential that they should be in numbers, that the *aura* might have sufficient power or intensity. Those observers, again, who have demonstrated, that impregnation is operated without the hive, deem it necessary that the drones should be numerous, otherwise the queen would have little chance of meeting any one in her course through the air: and others, even the most acute persons, who allowed themselves to believe, that here the solicitation was on the part of the female, thought that this redundancy of males was given, in order that she might make her choice. These reasons are to us alike unsatisfactory: the first, from its being utterly adverse to the laws which regulate the preservation of animals; the second, from resting on no surer basis than on simple conjecture, still unsanctioned by evidence; and the third, from being a conclusion on facts which never happen. Nevertheless it is unquestionable, that a hive, deprived of drones, will produce no young, though we cannot form an idea of the precise number necessary for the ends of generation.

After a particular period of the year, when the queen has been impregnated, and when the masculine properties of the drones are no longer of any use, they are mercilessly destroyed by those very workers which once watched so carefully over their origin. This is a fact well known, and has given birth to various hypothesis. In Britain, as in other countries, the period of the massacre probably depends on the advancement of the season, and always happens during the autumn months. The drones then flying from destruction, are seen on the flowers, occupying the panes of our windows, or wandering about from hive to hive, which they no sooner enter than death awaits them. This incident occurs sooner on the continent, where the seasons are earlier, compared with ours; and we shall cite the substance of some observations by a Swiss naturalist, by which it is materially illustrated. "It is usually in the months of July and August that the bees free themselves of the males. They are at that time driven away and pursued to the inmost parts of the hive, where they collect in numbers: and as many are then found dead on the ground, it was to be concluded that, after being expelled the hive, they are stung to death by the bees. Yet, on the surface of the comb, the sting is never observed to be used against them; the bees seem satisfied with pursuing and chasing them away. To ascertain the truth, we thought of getting the support of the hive made of glass, and of placing ourselves below, to discover what passed in the scene of action. A glass table was therefore constructed, on which six hives containing swarms of the same year were put, and lying under it, we endeavored to see in what manner the drones were destroyed. Our contrivance succeeded to admiration: on the 4th of July, we saw the workers actually massacre the males in the whole six swarms, at the same hour, and with the same peculiarities. The glass table was covered with bees full of animation, which flew on the drones as they came from the bottom of the hives; seized them by the antennæ, the wings, and the limbs; and, after having dragged them about, or, so to speak, after quartering them, they killed the unfortunate victims by repeated stings, directed between the rings of the belly. The moment that the formidable weapon, with which the workers are armed, touched them, was the last of their existence; they stretched their wings and expired. At the same time, as if the workers did not consider them so completely dead as they appeared to us, they struck the sting so deep that it could scarcely be withdrawn. Next day having resumed our position, we witnessed new scenes of carnage: during three hours the bees furiously destroyed their males. On the preceding evening they had massacred all their own; but now they attacked those which, driven from the neighboring hives, had taken refuge amongst them. We saw them also tear some remaining nymphs from the combs: they greedily sucked the whole fluid from the abdomen, and then carried them away. The following days no drones remained in the hives."

The cause of this cruel extirpation of so great a portion of the community, is very far from being evident. It is not enough to say, that it is from the drones being no longer of any use in propagating the species; or that their numbers would be a burden on the rest, seeing they are altogether inefficient. Conclusions deduced from either of these reasons, are not to be admitted in our present state of knowledge respecting the natural history of bees. Probably, however, our attention should be directed to the consequences of the drones having fulfilled the purposes of generation; for they are never destroyed in hives wanting queens, nor in hives where queens lay eggs producing males only. In both situations they are tolerated and fed, and may be seen living in perfect security throughout the winter. The massacre happens in those hives alone possessing queens completely fertile; but never until the season of swarming has elapsed.

In considering the nature of the individual species of bees inhabiting a hive, an acquaintance with which, we repeat, is indispensable before converting their labors to use, we have to notice some of the peculiarities exhibited by workers. It is to this great class that the welfare of a hive properly belongs: without their incessant aid, the males, females, and even the brood itself would quickly perish; and if the presence of a queen be essential to their safety, they are no less requisite for her preservation.

Certain facts, we have already remarked, tend to establish, that all workers are originally females; and in most, perhaps in every hive, some are found laying eggs, which will be future drones. But here viewing them as a large class of the community, consisting of twenty, thirty, nay forty thousand individuals, we behold them employed in various purposes, extremely diversified, for the general good. They are charged with cleaning and preparing the cells appropriated for their embryos of their own kind, of the queens, and the males: they collect the honey, obtain wax, and build the combs: likewise, they gather a particular substance, (resinous, as is supposed) with which all the crevices of the hive are closed, and its inside covered. After the queen has deposited her eggs, the workers supply the food adapted for the worms of each species, and regulate the proportions, so as to serve until the last metamorphosis is undergone: and they seal every cell with a covering, different, according to the different worm included, at the proper and appointed time. Nor are these the limits of their occupations; while some guard the queen, construct the combs, and watch over the necessities of the young, others keep constant watch, day and night, at the entrance of the hive: if a stranger bee, a wasp, or noxious insect appears, it is instantly repelled or destroyed: even should a queen, which, on usual occasions, is treated with such unequivocal marks of regard, be introduced to the hive of any swarm but her own, the workers immediately seize and restrain her, and, without being wounded with their stings, the confinement she suffers is such, that she sometimes dies of absolute suffocation.

All the operative parts of the œconomy of the hive are entrusted to the workers; and as the collection of honey and combs which they construct are the substances converted to our use, and indeed is the main purpose of our cultivating them in numbers, it is proper that we should elucidate the manner in which this is effected. Honey is a vegetable secretion, which appears at different seasons of the year, especially when flowers in general blow. We can readily understand how it is stored up by the bees: they lick it with the proboscis from the flowers; it is swallowed; and on their return to the hive, it is disgorged, not from the trunk, but the mouth, into the cells. Only a small portion is collected by each, but the united labors of thousands produce an abundant harvest. Reaumur has calculated, that within an hour 3000 bees have returned from their collections to a hive, whose population did not exceed 18,000; and in six days, Swammerdam, if we rightly understand his expressions, found nearly 4000 cells constructed by a new swarm, consisting of less than 6000 bees. Some of the cells filled with honey are destined for the daily consumption of the bees, and others are sealed up and reserved for times of necessity. Many of the laborers free themselves of their collections before reaching the cells, by bestowing them on their neighbors; the trunks of latter are seen extended, and they receive the honey with them as it is disgorged.

Honey being a vegetable product, its properties depend entirely on the nature of the plants from which it is collected: one kind is of the finest flavor, delicious to the taste, pure and transparent; another is entirely of a different consistence, dark, greenish, tenacious or bitter; and a third has been known to produce deleterious effects, which were almost, if not completely, fatal to human life. Dioscorides, Pliny, and various ancient authors, speak of honey in the east being dangerous in certain years; and Xenophon relates, that when the army of ten thousand approached Trebisond, the soldiers having partaken copiously of honey found in the neighborhood, were affected like persons inebriated; several, on whom it had more violent consequences, became furious, and seemed as if in the agonies of death. Though none of them died, all were extremely weak for three days. In recent times, we are told of the pernicious effects of a particular kind of honey collected in America; and plants grow in the Archipelago, the honey of which is said to occasion vomiting. Thus Don Felix Azara informs us, that there is a particular kind of honey collected in Paraguay, called *cabatatu*, which occasions a severe headach, and produces as perfect intoxication as ensues from brandy; while another kind brings on convulsions, attended with the most excruciating pains, which last thirty hours.

Bees are seen laden with a yellowish substance in very considerable quantities, which also is stored up in the hive. This is not wax, as is commonly supposed, but either the pollen of flowers, which is used for feeding their young, or propolis for stopping the crevices of their dwelling. The combs are constructed of wax, which owes its origin to honey: or it may be formed from sugar, the saccharine part of which constitutes one principal ingredient of honey. Naturalists have adopted many conjectures concerning the mode in which it is elaborated by the bees. In general they supposed that the yellowish pellets adhering to their limbs were swallowed, and afterwards disgorged as wax in a state of purity. The process is still obscure, but recent experiments seem to afford reason for believing that it may transude between the scales of the abdomen; and the appearance presented by wax on such places led former observers to affirm, that it was collected there instead of on the limbs. It is established by satisfactory experiments, that, whatever be its issue from the body of the bee, it originates from honey. Mutual relations subsist in their elementary principles, and the one is dependent on the other. Those years unproductive of the honey are also unproductive of wax; and we often see swarms which begin their collections with the most promising appearance, still make but little progress, and terminate with acquiring too small a quantity of honey for their future subsistence. In these cases, wax is sparingly provided also. What led to a narrow investigation of the preparation of honey from wax, was a naturalist observing that bees continued carrying quantities of the yellow pellets or pollen into hives quite full of comb, and where there was no room to construct more; and on the other hand, that they enlarged the combs of hives containing only a small portion, and did so without carrying in the pellets at all. Succeeding experiments proved that the pollen which they collect from the antheræ of flowers, is used solely for feeding their young, being the same which, in ordinary description, we call farina, or bee-bread; and that they will take it grain by grain in their teeth, to transmit it into the mouths of the larvæ: a remarkable trait of patient industry. In ascertaining the mode by which wax was produced from honey, M. Huber confined a swarm of bees in a straw hive to an apartment, along with a quantity of honey and water necessary for their subsistence. The honey was exhausted in five days, and five combs of the finest snow-white wax were then found suspended from the arch of the hive. Lest this might have been the produce of the farina carried in by the bees when their confinement commenced, all the combs were removed, and the imprisonment of the bees repeated. But the result was the same; they formed other five combs of the finest and whitest wax. It is the saccharine part of the honey which produces wax; and bees supplied with equal portions of honey, and of sugar reduced to a syrup, produce a greater quantity of wax from the latter. From a pound of refined sugar reduced to a syrup, and clarified with eggs, a swarm of bees produced ten drams and fifty-two grains of wax, darker in color than what they extract from honey: from a pound of dark brown sugar, they prepared twenty-two drams of very white wax, and the like from the same weight of sugar from the maple. Wax is produced sooner, as well as in greater proportion, from sugar than from honey; and the darker the sugar, the finer is the wax. Repeated observations prove, that the secretion of honey in flowers is powerfully promoted by the electricity of the atmosphere; and bees never labor more actively than during humid sultry weather, and when a storm is approaching. Sometimes the secretion of honey is entirely suspended by the state of the weather, which occasions a total interruption of the labors of the bees; and if this be too long protracted, a populous hive may actually die in the midst of summer. The odor exhaled by the hives, and the size of the bees, are always certain indications whether the flowers contain honey. When numbers of bees return from their excursions with the belly thick and cylindrical, it shows they are gorged with honey; and these are exclusively the workers in wax. The belly of those performing the other functions, always preserves its ovoidal form, and does not sensibly increase in size. Although the flowers be destitute of honey, bees still are able to store up quantities of farina or pollen necessary for feeding their young. Part of it is immediately given to them, and, as is affirmed, what is superfluous is reserved in cells. Sixty-five hives, the whole of which exhibited workers in wax, were examined on the 18th of June, when the country was covered with flowers, and while the bees actively pursued their collections. Those returning to old hives, having no cells to construct, deposited their honey in the combs, or gave to their companions; but those of new swarms converted their honey into wax, and hastened to build combs for the reception of their young. Chilly and showery weather interrupted their labors, and the combs received no addition by the construction of new cells. The weather however altered, the chestnut and elm were in flower, and the thermometer on the first of July rose to 77°: the bees resumed their labors with the utmost activity from that day until the 16th, both in honey and wax. But thenceforward no honey being produced, they collected quantities of pollen only; and the odor of the flowers showed there was nothing excepting an inconsiderable secretion of honey at intervals, barely sufficient for subsisting the bees. It was found, on examining the sixty-five hives in the end of August, that, after the middle of July, the bees had ceased to work in wax; that they had stored up a great quantity of pollen; that the honey of the old hives was very much diminished, and in the new ones scarce any remained; as what was at first collected had been consumed in the preparation of wax. Thus it appears, that, in the natural state, honey is the source of wax, and the food of bees; that its secretion from flowers is affected by adventitious circumstances; and that its qualities are different in different countries. No elementary principles of wax reside in pollen; this substance is collected solely to feed the young contained in hives, and the perfect bees themselves never live upon it.

The propolis is another substance collected from plants, which is extremely useful to bees. Besides the purposes of stopping crevices, covering the interior surface of the hive, the sticks supporting the combs, and glueing the hive to the board on which it stands, bees employ it in greater portions at once. Stranger animals of small size entering a hive are immediately stung to death, and then dragged by the bees to the outside: there are few persons who have not seen that a dead fly, or bee laid on their board, is quickly carried away and dropped at a distance; it seems the nature of these insects not to endure any filth or corruption in their habitation. Should a larger animal, such as a snail, make its way into the hive, it does not escape; it is put to death, but the bees are unable to divest themselves of its body. Maraldi relates, that he saw the dead body of a snail totally covered with propolis, and thus prevented from spreading infection in the hive; and Reaumur tells us, that a shell snail having fixed itself on the pane of a glass hive, waiting until the moistness of weather should be an inducement for it to move, the bees encircled the mouth of the shell with so thick a bed of propolis, that the animal, unable to moisten it as it moistens its own gluten, was arrested on the spot. The original source of the propolis is not yet perfectly understood: it is much more tenacious, and attains a greater degree of hardness than wax: those bees that return laden with it, owing to its tenacity, experience considerable difficulty, even with the aid of their companions, in divesting themselves of the load. M. Ducarne observes, "several times I have seen bees occupied in collecting, or rather in tearing away with their teeth, the propolis of old hives which I had exposed to the sun; and this appeared so laborious, and the animals pulled so forcibly, that I thought their heads would have been separated from their bodies."

The structure of the cells, which are exclusively the production of the workers, has excited admiration in every contemplative mind; and it is demonstrable, that their figure is the best adapted for containing the greatest possible quantity in the least possible space. A number of cells united constitute the comb, between twelve and thirteen inches square of which, Reaumur calculated, would contain 9000. The primary object of the cells seems to be for propagating the young; after these have gained maturity, they are cleaned out and filled with honey; but there are cells also destined for this purpose from the beginning. The same cells may be employed for several successive broods, and when the whole have come to perfection, they are appropriated for the winter stores: those at the top of a comb are neatest and best made, as well as of better materials, compared with those at the bottom. In the shape and size of the comb, bees are guided by circumstances; a small cavity is totally filled with equal combs, while in one of greater dimensions there may be some large, and others not one-fourth of the size. By a law of nature, from which they seldom deviate, the foundation of the second comb is laid parallel to that of the first, and the successive combs are generally parallel to each other. Sometimes they are seen at right angles, or apparently misplaced, which probably results from accidents having an influence on the earlier part of their construction. There is usually the distance of four lines between each; and should the comb, in its construction, have taken an oblique direction, it is afterwards brought into a more perpendicular line by the bees, which diminishes the vacancy intervening. Combs originate in the top or arch of a hive, and are worked downwards; but should the upper part be removed, it is said the bees will work upwards to fill the cavity. In order to shorten the courses which they would necessarily have to make round the surface of large combs, they open various communications through them, and also open passages between their edges and the side of the hive; at least we are not acquainted with any other purposes of such perforations found in them. The cells composing a comb are of three kinds, corresponding to the three species of bees; but there are considerable irregularities in the structure of all; neither do those of the workers invariably exhibit that perfect hexagonal figure which many persons expect to find. It may appear singular how bees can fill horizontal cells quite full of honey, and yet prevent it from escaping. Perhaps it is partly retained by its own viscosity, and from adhesion to the sides of a tube of such small diameter. Each cell is sealed with a flat covering most ingeniously devised: it is nature, however, that must have done so. A circle is formed around the mouth of the cell, which is gradually diminished by other concentric circles, until the aperture remains a point capable of being closed by a single grain of wax.

Though the hive be amply stored with honey and wax, and the young brood gradually approaching to maturity seems to leave nothing to be desired by the bees, they all of a sudden desert their habitation to go in quest of another. For this incident, which is called *swarming*, there is no ostensible cause, nor do the reasons assigned for it by different observers prove satisfactory in our estimation; for its occurrence is irregular, and its frequency is uncertain. According to common apprehension, swarming ensues from a hive being overstocked with bees, and especially from a young queen seeking a new dwelling. It never takes place, we acknowledge, unless the bees be numerous; but there are so many exceptions, that we cannot say it is from wanting room: and instead of the young queen, it is always the old one that leads out the swarm: nay, should an old queen have conducted a swarm of this year, she will also be found at the head of the first which next year leaves the hive. Each subsequent colony departing is led by a young queen. An old queen never leaves her hive until she has deposited eggs which will become future queens, nor until her principal laying of the eggs producing drones is over; the common bees construct royal cells only, while she lays those eggs which will be transformed to drones; and after this laying terminates, her belly being more slender, she is better able to fly; whereas it is previously so heavy and surcharged with eggs, that she can hardly drag herself along. One chief cause or concomitant of swarming apparently consists in the agitation of the queen. She is suddenly affected, hastily traverses the combs, abandoning that slow and steady progression which she ordinarily exhibits: her agitation is communicated to the bees; they crowd to the outlets of the hive, and the queen escaping first, they hasten to follow her. Commonly the whole take but a short flight, and the queen having alighted, the bees cluster around her. This constitutes the new swarm. With regard to the precursors of swarming, there is no infallible guide: those on which observers are accustomed to rely, the most frequently prove fallacious. The general indications given by Reaumur, a naturalist of the first eminence, who draws his conclusions from facts, and has fallen into few errors, are, first, the appearance of drones in a hive; for no swarm will proceed from one where there are none; secondly, when the bees are so numerous, that part crowd about the outside of the hive, or lodge on the board in clusters of thousands: and thirdly, which is the least equivocal sign of the day of swarming, when fewer bees than usual go abroad for collection, and return without honey or wax. Most observers also affirm, that in the evening before swarming an uncommon humming or buzzing is heard in the hive, and a distinct sound from the queen, called *tolling* or *calling*. Mr. Hunter compares it to a note of a piano forte; and other authors to different tones. This we rather incline to suppose is not an indication of swarming, but a proof that there is a young queen as yet confined in her cell, and that probably the sound proceeds from her. We shall afterwards have occasion to say a few words concerning the power of a queen in emitting sounds, and the wonderful effect which these instantly produce on the whole workers.

In illustrating the concomitants of swarming, we shall again resort to the observations of the naturalist Huber, one of the few investigators of the subject, whose remarks are to be received with implicit credit. After establishing that an old queen conducts swarms, leaving worms or nymphs in the hive, which, in their turn, transform to queens, he availed himself of a favorable season to follow their history in the perfect state.

A young queen being introduced into a hive on the 12th of May, the bees received her well, and she immediately began laying. Twelve royal cells, all situated on the edges of the communications or passages through the combs, were begun on the twentieth, and on the twenty-seventh, ten of them were much, but unequally, enlarged. On the twenty-eighth, previous to which the queen had ceased laying, her belly was very slender, and she began to exhibit signs of agitation. Her motion soon became more lively, though she still continued examining the cells, as if about to lay: sometimes introducing her belly, but suddenly withdrawing it without having laid; at other times depositing an egg in a different position from what it should naturally have. The queen produced no audible sound in her course, nor was any thing heard different from the ordinary humming of bees. She passed over the workers in her way: at times, on stopping, those meeting her also stopped, and seeming to consider her, advanced briskly, struck her with their antennæ, and mounted on her back; and she proceeded thus carrying some of them above her. The bees no longer inclosed and formed regular circles around the queen, nor did they supply her with honey; but she voluntarily took it from the cells in her way. Those which were first aroused by her motions, followed her, running in the same manner, and in their passage excited others still tranquil on the combs. The path she had traversed was evident after she had left it, by the agitation there created, which never afterwards subsided. The queen had now visited every part of the hive, and occasioned a general agitation: if some places yet remained quiet, the bees in motion arrived, and imparted that which affected them. The queen discontinued depositing her eggs in the cells: she dropped them at random; and the workers ceased to watch over the young. They ran about in every different direction: even those returning from the fields before the agitation reached its height, no sooner entered the hive, than they participated in the same tumultuous impulse: they neglected to free themselves of the waxen pellets on their limbs, and ran heedlessly about. At last the whole rushed precipitately to the outlets of the hive, and the queen along with them.

These facts were ascertained with the utmost care, and corroborated by future experiments. On the first of June, all was quiet in a hive at eleven in the forenoon; but at mid-day the queen, from a state of perfect tranquillity, became evidently agitated, and her agitation was insensibly communicated to the workers in every part of their dwelling. In a few minutes they precipitately crowded to the outlets, and, along with the queen, left the hive. After they had settled on the branch of a neighboring tree, the observer sought for the queen, thinking, if she was removed, that the bees would return to the hive: a fact which actually ensued. Their first care then seemed to consist in seeking their female: they were still in great agitation, which gradually subsided, and in three hours complete tranquillity was restored.

Our limits preclude us from entering at sufficient length on this most interesting part of the natural economy of bees, and we must be content with referring to the works of the two celebrated authors already cited. The latter ascribes the chief inducement of those bees conducted by young queens to swarm, to the agitation by which the queen is animated being imparted to them. He endeavors to trace the source of that agitation to the antipathy mutually entertained by the females, which, extending even to those in an imperfect state, is directed against the nymphs lodged in the cells. No sooner does a young queen herself attain maturity, than she attempts to destroy her rivals: but there is a constant guard of workers preserved over them; she is repulsed, maltreated, and driven away. If deserting one cell she approaches another, it is to experience the same resistance; she is actuated by an unconquerable desire to accomplish her object; she is harassed by the incessant opposition of the bees; agitation thence ensues, and she resolves on flight. It is here to be observed, that although experiments prove that the agitation of a queen is communicated to the workers, and though, with regard to young queens, such may influence the bees to swarm, the same reasons will not apply to old queens leading forth new colonies, for what we have above described only belongs to young ones. So long as a young queen remains in a virgin state, she meets with little of that conspicuous respect, care, and attention, which is lavished on her when the bees know she is about to become a mother. She is previous treated with great indifference; and hence arises the resistance she suffers when attempting to destroy the nymphs in their cells, and her consequent agitation. "But the conduct of the bees towards the old queen, destined to conduct the first swarm, is very different. Always accustomed to respect their fertile queens, they do not forget what they owe to her: they allow her the most uncontrouled liberty. She is permitted to approach the royal cells; and if she even attempts to destroy them, no opposition is offered by the bees. Thus her inclinations are not obstructed; and we cannot ascribe her flight, as that of the young queens, to the resistance she experiences." These observations greatly increase the difficulty of attempting to account for swarming: we acknowledge that here we can find no satisfactory explanation. The old queen, it has been supposed, becomes agitated by the presence of so many royal cells, and at the prospect of the combats in which she has to engage, and she also communicates her agitation to the workers. The agitation of the females excites motion in the workers, which increases their animal heat, and raises the temperature of the hive to such an insupportable degree, that they hasten to leave it. In a populous hive, where the thermometer stood from 92° to 97° in a fine summer day, it rose above 104° during the tumult which preceded swarming.

The extraordinary instinct and precautions so conspicuous in bees, are apparently affected during the period of swarming. We cannot admit, with those observers, who seem more actuated by the love of the marvellous than an exposure of truth, that they are endowed with that prescience which induces them, before their departure, to prepare a place for their reception. On issuing from the hive, bees, so nearly as we can determine, have no object in view; and they often resort to situations the most unlikely, and evidently unsuitable for their convenience or preservation. After rising in the air, it is commonly some tree that arrests their progress, and the queen frequently alights at the unsheltered extremity of a branch, where the bees that may have formed into various clusters in the vicinity, come to surround her. But we have known them repeatedly swarm on the grass, near the hive they had forsaken, notwithstanding trees were at no great distance.

Bees swarm only during the best weather, and in the finest part of the day. Sometimes all the precursors of swarming, disorder and agitation, have been seen: but a cloud passed before the sun, and tranquillity was restored.

If a hive swarms oftener than once, the new swarms consist of those bees that have been abroad when the first event took place, added to young ones come from the eggs, laid by the queen before her departure. Each is led out by a young queen, as there are usually several royal cells in a hive: but the bees can prevent the whole queens nearly of an equal age from leaving their cells, though come to maturity: and when they do liberate them, it is according to their age, which they have some secret means of ascertaining; for the oldest are invariably liberated first.

The young swarm, whether removed from the place where it settles or not, begins to work; cells are constructed of wax from the honey the bees have carried along with them; and nature has so arranged it, that the first eggs laid by the queen produce the operative part of the community.

ON THE USUAL CARELESSNESS IN SAVING SILK-WORMS' EGGS.

To the Editor of the Farmers' Register.

Stafford, August 5th, 1839.

I am highly gratified that you have given the agricultural community a caution about silk-worm eggs. At least two-thirds of the failures in rearing silk-worms in this country may with propriety be attributed to bad eggs. Many persons raise silk-worms for the *sole* purpose of speculating on the eggs, and are probably not aware of the necessity of careful management to procure good eggs. Prevailing thoughtlessness on this subject, which I know exists extensively, if not checked, will throw serious obstacles in the way of this important culture, which I firmly believe is destined to repopulate the poor land districts in Virginia and Maryland. I will add a caution which may be of service to the inexperienced. If the cocoons intended for seed are thrown into a heap, and permitted to remain for several hours, when the weather is warm, the eggs produced will generally be worthless. I know this to be the fact from dear bought experience.

"When silk-worms are to be raised, the eggs to be procured from the cocoons, must be thought of before any thing else. Now-a-days when the cocoons are collected, it is the custom to keep them altogether upon the frames. Some persons not having time to reel all their silk, butterflies are seen to go out and lay eggs almost immediately. The accumulation of cocoons produce a kind of fermentation, and the heat causes the butterflies to hatch before the proper period. This premature developement has never any good results, for the butterflies are sick; and from thence it comes that the silk-worms produced from their eggs, are affected by diseases from the moment of their hatching.

"The cocoons for reproduction ought to be separated, *and put in a well aired chamber*, and spread upon very clean mats, *a layer of the thickness of a single cocoon only*." (*Chinese Treatise, published by P. Force, p.* 150.)

I have about 40,000 silk-worms of seven varieties. They are remarkably healthy, and a large portion of them spinning in handsome style. In September I will furnish you a meteorological record, with explanating remarks.

Respectfully yours,
LAYTON Y. ATKINS.

P. S. There is no advantage to be derived from a forced and premature developement of the silk-worm in any of its stages. The nearer the time of spinning to the natural period of its life, as stated by Dandolo, the better. The *precocious* and the *tardy* are always feeble, and eggs should never be saved from them. I have made nine rearings of the "two-crop" white, and of the cocoons formed between the 25th and 30th days it has required from 700 to 800 to weigh a pound, and so of the last which spin; but of cocoons formed from the 30th to the 35th day, 350 to 400 to make a pound. Depend upon it modern writers on silk-culture are promulgating a pernicious error on this point; and before the learned *silk-worm* doctors publish any more *infallible* prescriptions, I advise them to put on their spectacles and bring their remedies to bear on four or five cases.

If a *forced* and premature developement is so important what reason or sense would there be in the following passage from the Chinese Treatise:

"The moths which come out the first day are called *grass moths*. The last of all are called *mogno*, (that is to say, the last butterflies.) *Neither* of these ought *to be kept*."

Mark the care of this people about procuring eggs. Cocoons are first selected, and when the butterflies come out, the *first* and the *last* are rejected. Let the people of the United States make numerous and careful experiments. We *beardless* boys of Virginia at least, do not mean to open wide our mouths and swallow nostrums as an unfledged bird does its food. L. Y. A.

COPPER MINE IN NORTH CAROLINA.

To the Editor of the Farmers' Register.

Williamsburg, 15*th August*, 1839.

I take the liberty of sending you the following advertisement, taken from the 'Virginia Gazette,' printed in this city for William Parks, 16th February, 1738. It is possible that it may not be known at this time, that there is a copper mine in North Carolina; if so, the fact may benefit some indivividual, and perhaps our country. The information is given for your use, by your friend,

RICHARD RANDOLPH.

"To be sold by Charles Evans, ferry keeper on Tar River, 15 miles from Speece's ferry on Roanoke river, in North Carolina, at ten pounds, Virginia currency, per hundred, 2000 acres of very good land, being purchase land, granted in the proprietor's time, at six pence per hundred quit-rent forever; and in the banks thereof, is a copper mine, twice tryed in England. It runs five miles on the river, is very commodious for trade, with two cypress swamps thereon, and near adjoining to a desart, called the Canetar, supposed to be 10 miles wide, and thirty miles long, and there is brave hunting the bear. CHARLES EVANS."

The foregoing advertisement is not sufficient proof of the existence of copper ore, at least in profitable quantity. From one of the old manuscript journals of Col. William Byrd, (which curious and interesting records of old times we hope to be enabled hereafter to publish,) it appears that there was formerly a copper-mine mania raging along the borders of the upper Roanoke, which has since passed away, leaving no known trace of its existence, save what is presented in his journal and this old advertisement.—ED. F. R.

"THE DEBT-PAYING NATION."

From the Genesee Farmer.

This is the name which the United States have acquired abroad, and never was an appellation better deserved. We, as a nation, run in debt more to others, than perhaps all other nations put together. What would be said if Great Britain should run in debt two hundred millions to France, or Prussia fifty millions to Austria. We, on the contrary, think nothing of selling our credit to the amount of a hundred or two of millions, in the shape of stocks, and then purchase goods annually to the amount of some twenty millions more than we can pay at the time, trusting to luck, and tempting Providence. It requires no prophetic sagacity to foretell that matters cannot always go on at this rate. Our credit must be over-taxed in time, and though our resources are immense, a sudden invitation to 'hand over' would produce a convulsion, of which we who remember 1837, may form a faint conception; a convulsion in which the credit and the floating capital of the country would alike go to ruin. The individual is on the high road to bankruptcy, whose average expense exceeds his annual income, and the same is equally true of nations. How stands the matter with us in this respect?

In 1837 we imported in flour and wheat,	$4,276,776	
In the same time we exported of the same,	3,075,475	
Leaving a blance against us of	$1,201.201	for our bread.
In 1837 we imported of sugar,	$7,205,904	
And we exported,	76,181	
Leaving against us a balance, of	$7,129,723	for our sugar
In 1837 the whole of our imports was	$140,989,217	
And the sum total of our exports was	117,419,276	
Leaving against us a balance of	$23,569,941	

But it will be said, this balance is paid, and the debt cancelled. So it is, but how? by transferring the account from the individuals who contracted it, to the country itself. In other words, this twenty-three millions and many more similar balances of trade against us, have been paid in stocks, or the credit of the states has been loaned to secure the foreign dealer. These balances of trade against us *are not paid*, and when they will be, if we continue to buy much and sell little, is beginning to be a serious question. We are in a fair way to have a national debt accumulated upon us equal to that of Great Britain; a debt, to pay the interest of which, is now weighing her agriculturists and manufacturers to the dust. The only difference will be, her indebtedness is to her own citizens; ours will be to foreigners, and a fearful power it will be for them to wield over us.

How shall this alarming evil be remedied? It would be easy to say, retrench, buy less, and sell more. But such is not usually the course of individuals or nations. We have gratified our wants until they have become so interwoven with our system, that retrenchment in the means of satisfying them is not likely to be a favorite doctrine, however just and feasible it may be. The only way, then, for us, if we will have just so such, is *either to produce the things ourselves, or something that will pay for them.* We *can* raise our own *bread*, and have a large surplus to sell. We can make all the *sugar* demanded in the country, and we must do it. We can make the silk wanted in the United States, and if we are wise we shall soon do it, and put a stop to the largest item in the balance against us; an item of from fifteen to twenty millions annually. Supply ourselves with these three items, and we turn the balance of trade in our favor, and bring the world in debt to us. In that case we should become a "debt-receiving" instead of a "debt-paying nation," and the difference there is between the actual pleasure of these two operations, (to say nothing of the profit,) will be appreciated by most.

SILK MANUFACTURING.

From the Genesee Farmer.

One great reason why we have such an unshaken confidence in the ability of this country to enter successfully into the culture of silk, its manufacture as well as its production, is found in the superior enterprise, industry and ingenuity of our citizens, over those of any part of the world. Great Britain thought to prevent the establishment of the cotton manufacture in this and other countries, by prohibiting, under severe penalties, the exportation of machinery, or patterns for its construction. New England machinists went to work, built shops, made their own patterns, and produced specimens of machinery so much superior in action and principle to European models, that we at once obtained the preference in their own market, and now annually export large quantities of machinery to order. So it is already with machinery for the manufacture of silk. In reeling, and now in weaving the narrow kinds of silk, such as laces, ribbons, and other goods of that description, we have already made great advances on the clumsy and ill-arranged implements of the old world.

In the manufacture of ribbons, which forms so important a branch of the Lyons, or French silk manufacture, the foreign workman uses a narrow loom, resembling the common hand-loom in either respects, and weaving but one piece of ribbon at a time. A machine, called in France a Jacquard, is attached to this narrow loom, and regulates the pattern of the ribbon, flowers, &c. These looms are worked by girls, and these delicate and beautiful fabrics are the result of their labors. A Jacquard was brought to New-York, and fell under the notice of Mr. Bergen, an ingenious mechanic, and member of the legislature. Mr. Bergen instantly saw that great improvements might be made in the machine and loom, and immediately constructed one which is worked by power instead of the hand, makes seven pieces of ribbon or lace, where only one was made in the French loom, and gives the figure, color, or pattern, with equal exactness and greater rapidity. In this single improvement of the ribbon loom, then, five or six-sevenths of the labor required abroad is wholly dispensed with, and articles of any pattern can at once be furnished. In very narrow patterns, from ten to fifteen pieces can be woven at once. Such improvements at the outset leave no room for doubt, but that when the attention of our artizans shall be directed to the manufacture of silk machinery, we shall soon find our improved processes amply to compensate for any supposed difference in the price of labor.

DEPTH OF FROZEN EARTH IN NORTHERN LATITUDES.

From the Genesee Farmer.

Mr. Schergin, a merchant of Jakutsk in Siberia, anxious to possess a well from which water might be obtained without being obliged to use melted ice for half the year, commenced boring through the frozen earth which always exists at a short distance below the surface, with the intention of reaching the unfrozen springs below. The place is in lat. 62° the themometer in December as low as 42° below zero, and in July was 79° above. Average temperature 18°. After penetrating 50 feet, the temperature was found to be 18°. At 77 feet 19°. At 119 feet 23°. At 382 feet 30°. This rate gives an increase of temperature of 1° for every 60 feet; and proves that the boring to unfrozen water must equal about 600 feet. As a necessary consequence, the large rivers and springs in such districts must draw their supplies from regions farther south, and below the frozen strata, or they would be dry every winter, which in Siberia is found to be the fact with most of them. Wrangel and Frebre state that in Siberia, in the open lands, the surface is thawed during the summer to the depth of 2 1-2 to five feet; but that in the forests it only reached from 3-4 foot to 1 1-2 in depth. This is a curious fact, as showing how near vegetation can be brought in contact with ice, and that growth in plants depends more on the temperature of the air in the spring, than on that of the soil.

ON KEEPING POULTRY.

From the Maine Farmer.

Messrs. Editors :—I once knew a couple of industrious sisters, who lived near a never failing brook or stream in Massachusetts, who kept generally through the winter 30 geese, male and female. They had erected some suitable but not costly sheds, in which they had apartments for them to lay, set and hatch. Their food in the winter was meal of the various kinds, to some extent, but principally apples and roots. In the summer they had a pasture inclosed with stone wall or board fence, which embraced the water.—They kept their wings so clipped that they could not fly over such fence. Their owners well knew (what we all know,) that live geese feathers are a cash article, at a fair price. They picked off their feathers three times in the season. Those 30 geese wintered, would arise say 75 goslings or young geese, and of course they had that number to dispose of every fall or in the beginning of winter, when they are sent to market, and again picked making four times that they obtained feathers from those they wintered, and twice from the young ones that they killed.

I tell the story to induce some family, sisters or brothers, fathers or mothers, situate near some never failing brook of water, to go and do likewise. Those remote from water cannot be benefited by the history, yet their friends may; but if I can by this account cause one family to partake of the benefits of the business, I shall be satisfied. Many families there are, in all our towns, so situated that they may make the raising of geese a profitable business; yet perhaps have never thought of their privileges. It is known that we import most of our feathers; and is it necessary to send abroad for an article so easily produced among us? Those who calculate to commence the business must prepare for it the ensuing fall, and not kill their geese. No one will object to the keeping of even more than 30 geese, if an enclosure is made sufficient to keep them at home and out of mischief.

N. P.

COWS HOLDING UP THEIR MILK.

From the Maine Farmer.

Messrs. Editors:—You will recollect that in a late No. of the Farmer I mentioned that I had a cow that gave very little milk in the morning, and that she gave more at night as a consequence, &c.; and that a Mr. Foss had a cow that did the same. I requested the why and wherefore of you or some of your correspondents, and also the cure. You remark that you had a cow with the same complaint, and thought possible some one milked her besides yourself. I hear that many other people are making similar complaints of their cows.

As I think I have discovered the cause, I will state it as respects mine. She lodges on sand or gravel in a yard where there is no sward or orts, hay or straw, and during this long spell of wet weather her lodging had been cold. At the suggestion of a neighbor, after the cow was milked at night, I sent her back to the pasture where she might lay on a ledgy warm place, and the cure has been effected; whether by this or not you and others may judge. I know that in the fall, when the weather is colder, and the nights longer, the same result does not take place when our cows lay out. But then their hair is longer,—mine having recently shed her old hair and the new being very short. I wish that others having cows that hold up their milk will try my remedy, and let me know the result. SAM'L. WOOD.

LIQUID LEATHER.

From the Maine Farmer.

We have seen it stated that some one in Europe has invented what he calls liquid leather. The process he keeps a profound secret, but it is said the matter is liquid, and may be cast into any form such as boots, shoes, &c.

The material is probably some preparation of animal gelantine, at any rate we will *guess* so. If animal gelatine be mingled with the proper quantity of tannin, such as the strong liquor of hemlock or oak bark, it coagulates and becomes solid. Now if the two ingredients can be properly proportioned, no doubt it can be formed into any shape whatever.

It is this which changes skins or hides into leather. Hides however have fibers which add to the toughness and strength of the leather, which might not be the case in changing gelatine to leather. Some one who has leisure to experiment upon it, can take glue and bark liquor and amuse himself, and perhaps find out something new to him, if he don't get the real secret. If you spit into strong bark liquor, a coagulum is formed occasioned by the slight quantity of mucus matter contained in the spittle. If raw hide be put into a Papin's digester, which is a small steam boiler with a safety valve so that the water can be heated much higher than boiling water,(212°) and heated for some little time, it will become almost wholly or quite dissolved, and in this form it might be better for experimenting upon perhaps than a simple solution of glue, which is purer and has less animal fibre.

Horns may thus be rendered almost or quite fluid in this way, and undoubtedly might be put to many more uses than they are at present.

TO FATTEN POULTRY.

From the Maine Farmer.

An experiment has lately been tried of feeding geese with turnips cut in small pieces like dice, but less in size, and put into a trough of water; with this food alone, the effect was that 6 geese, each when lean weighing only 9 lbs., actually gained 20 lbs. each in about three weeks fattening.

Malt is an excellent food for geese and turkeys; grains are preferred for the sake of economy, unless for immediate and rapid fattening: the grains should be boiled afresh.

Other cheap articles for fattening are oatmeal and treacle; barley-meal and milk; boiled oats and ground malt.

Corn before being given to fowls should always be crushed and soaked in water. The food will thus go further, and it will help digestion. Hens fed thus have been known to lay during the whole of the winter months.

EARLY CUT CLOVER.

From the Boston Cultivator.

In 1818, when living on the banks of the Kennebec, in Maine, we had a fine piece of clover that we feared would grow too rank to be relished by our cattle. We therefore mowed it on the twenty-fifth of June when not one-half the heads had blown fully out.

We suffered it to lie *in the sun* for three days —turning it over at night to bring the greenest side up to take the dews. On the third day it was raked and carted. We cannot say we saved all the heads and the leaves, but we looked to the main chance; we saved the stalks—the substance —and our cattle would insist on eating them *all*.

In feeding out this hay we could not but note the difference between a forkful of it and a forkful of hay cut late. It was apparently one-third heavier. Our cattle never throve better on any hay, and their manure, not black as when their keeping is poor, or late cut hay, looked precisely as if they had been kept partially on Indian meal.

TEMPERATURE IN GREAT BRITAIN AND THE UNITED STATES

From the Genesee Farmer.

While the average temperature of the year in England exceeds that of the northern part of the United States, the average of the three summer months there, falls very much blow the average of the same months here. Thus in the agricultural reports of some of the English counties for last year, it was stated that "frosts were frequent during the months of July and August." We have been sometimes asked why corn as well as wheat cannot be grown in England. The true reason is found in this low temperature of the summer months; which while it proves not unfavorable for wheat, renders the ripening of corn impossible. Wheat will be best in a temperature that averages from 60 to 70 degrees, as the stalk takes more time to grow, does not suffer from drought, and gives a finer, heavier berry than is usually produced where the temperature is higher. Great Britain is of course one of the best wheat countries in the world. Corn on the contrary will not arrive at maturity under a less degree of heat than from 70° to 80°, and if the average of the three summer months does not range between 75 and 80, a good crop of corn can hardly be expected. Thus in England corn will never be grown; a law of nature that cannot be broken forbids it.

CAUSE OF GREATER VALUE OF GYPSUM ON LIMED LAND.

To the Editor of the Farmers' Register.

One of your correspondents, whose communication you published in the July number of the Register, uses the following language. "I can assure you and your readers, that that the use of plaster of Paris, after lime, works strangely and wonderfully. You may explain why it is so; for me, it is sufficient to see and know that it so." I readily agree with your correspondent that in such a case fact is of more importance than theory; but I suppose most of the readers of the Register will admit that fact and theory together, is better than either of them separately. Indeed mankind are naturally theorizers; that is, when any thing unusual occurs in the natural world, they are disposed to inquire into the causes, and however valuable the knowledge the fact above may have been, yet when, in addition to the fact, a knowledge of its cause is obtained, it affords an exquisite pleasure to the mind. Indeed I have long been of opinion that one important use of mechanical and chemical philosophy, is, that they render much of the common business of life more intellectual, and, on that account, will be more relished by men of cultivated minds. I am far, however, from supposing that this is the only or even the principal use of mechanical and chemical science. But I did not sit down to write a treatise on the use of science; but to endeavor to furnish your correspondent with a theory to explain his fact; for, notwithstanding his apparent indifference about theory, I am disposed to believe that it will afford him considerable pleasure to be able not only to say that the fact is so; but also to say why it is so.

I have long had a theory upon the subject which your correspondent mentions, which, to myself at least, was entirely satisfactory; so that had I been a neighbor to your correspondent, and witnessed the fact which, it seems, was to him strange and wonderful, would have been to me neither the one nor the other, but precisely the thing, I would have expected. I will now proceed to explain my theory, and the process by which it was obtained.

There is scarcely any fact more obvious than this, that the great volume or bulk of all vegetables is carbon. Although this fact was doubtless known from time immemorial, yet it seems to have attracted no attention in a theoretic point of view until modern times. When the attention of modern chemists was turned to the vegetable department of science, they naturally inquired, whence and how do vegetables obtain the carbon which constitutes so large a portion of their substance? This was a question not easily answered. Carbon is a simple substance, and insoluble in water. It is moreover not found to exist in the most productive soils, nor even in the richest manures. Some chemists, not adverting to the fact that carbon is insoluble in water, supposed that pulverized charcoal would be an excellent manure. A Dr. Ewell, a native of this state, published, about the beginning of the present century, a book in which he asserted, with great apparent confidence, that pulverized charcoal would be one of the best of manures. A friend of mine who was largely engaged in rectifying that abominable thing called whiskey, and consequently used a large quantity of pulverized charcoal, made the experiment. But he found that charcoal, though ground as fine as flour was not a manure. He might as well (as Professor Armstrong expresses it,) have used pounded glass.* But my friend, the rectifyer of whiskey, was not the only person who made the experiment. Experiments were made in various parts of the world, and all with like success, or rather want of success. Still, the question whence do vegetables obtain their carbon, remained unanswered. At length by a variety of experiments carefully made, by different experimenters, in different parts of the world the question was satisfactorily answered. *It is from carbonic acid, that vegetables obtain their carbon.* The roots of the vegetables attract from the soil the water or moisture mixed with carbonic acid, and as the water thus mingled with carbonic acid passes up through the tubes of the vegetable, by a process concealed from mortal ken, the carbonic acid is decomposed, and when the sun shines on the vegetable, the oxygen of the acid is breathed forth into the atmosphere and the carbon is retained. This beautiful theory is surely as interesting as a view of the passage of the Potomac through the Blue Ridge, which Mr. Jefferson said, was worth a voyage across the Atlantic. Nearly one-half, by weight, of limestone, marble, in short of all carbonates of lime, is carbonic acid. Quick-lime, or lime when newly burnt, has no carbonic acid, but its attraction for carbonic acid is so great, that, if exposed to the atmosphere, it soon saturates itself with carbonic acid, and thus returns to the state of a carbonate. When a man then limes his land, he mixes with it an article which possesses not only the various valuable qualities which you, Mr. Editor, have so well pointed out in your invaluable 'Essay on Calcareous Manures;' but, also possesses the power of attracting from the atmosphere and retaining in the soil ready for use, the very thing which furnishes their chief food to all vegetables.

But the carbonate of lime is a concrete substance, and its carbonic acid is intimately combined with the lime; hence, it will not, we may suppose, easily yield its acid to the rains and moisture of the earth, and what it does yield, will be parted from slowly, and in small quantities. But as the carbonate of lime possesses various other properties besides the one I have just mentioned, when it it first applied to the land, it may produce a powerful effect chiefly by those other properties, but ultimately becomes chiefly useful as a depository of carbonic acid. But this acid it parts with reluctantly. Then apply a little plaster of Paris, (sulphate of lime) and by their mutual action on each other the carbonate of lime easily yields its carbonic acids, and the vegetables growing on the soil thus having an ample supply of carbon, will grow as they had never been seen to grow on that soil before.

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* See Professor Armstrong's Essay on Vegetable Physiology, July No. of the Farmers' Register, Chapter XVI.

Now, your correspondent, to whom this is chiefly addressed, will see what my theory is, and most of the steps by which my mind was led to embrace it. He will see, moreover, that it accounts for the great effect the plaster of Paris produced upon his limed land. Before I conclude, I ought to remark that although I have called the above theory "my theory," I do not mean to assert that it is exclusively mine. Doubtless the two ideas, viz. that one of the chief uses of lime or marl, as a manure, is, that it furnishes a supply of carbonic acid, and that the use of gypsum will facilitate the extrication of that acid, have occurred to the minds of many other persons; each one may say, the theory is mine, but not exclusively mine. It is one however which I have entertained for many years.

I entirely agree with your correspondent, when he says that "lime only will show where the great father of nature has placed the limit of fertility, when lime, plaster, and their produce of vegetable matter, are turned back and reacted upon." Clover I presume takes badly in the light sandy lands of tide-water Virginia. Whenever persons, who have brought their lands to moderate state of fertility, by lime or marl, find this to be the case, let such persons supply themselves with rollers to be drawn either by one or two horses. Immediately after sowing the clover seed, run a roller over the field, and, if the season is not unfavorable, the seed will vegetate and grow. When the clover is of suitable age, sow gypsum for two years, and during the fall of the second year, be the clover knee high, or haunch high, plough it down. Next spring plant the field with corn, and go on with a judicious rotation of crops, careful husbanding and application of putrescent manures, and the next generation may see some of the pine barrens of tide-water Virginia producing from twelve to fifteen barrels of Indian corn to the acre.

I have already referred to Professor Armstrong's Essays on Vegetable Physiology, which you have been for some time publishing in the Farmers' Register. I would recommend them to the especial attention of your readers generally, both male and female. They are written in a plain, familiar, perspicuous style, and contain much interesting and valuable information. I fear many of the readers of the Register overlook those essays, under an impression that they are too learned for common readers. But, if any intelligent person, although without any previous knowledge of chemistry, will begin at the beginning of those essays and read them regularly on, I am much mistaken, if he will not find that he can understand them with ease, and will find a new and delightful field of knowledge opened to his mind. Even those who have already some knowledge of chemistry, will find them pleasant and useful. **Senex.**

CIRCULAR LETTER OF THE COMMISSIONER OF THE PATENT OFFCE.

[The following letter will best explain its excellent object. It is earnestly hoped that the zeal of the Commissioner for the advancement of agricultural interests may be properly responded to by the various individuals to whom the circular has been addressed, and his object furthered, and made sure, by the proper aid of government.—Ed. F. R.]

Washington City, D. C., Patent Office, June 1st, 1839.

Sir,—During the last session of congress, an act was passed authorizing the Commissioner of Patents to collect statistics, and in various other modes, to promote the agricultural interest of the United States. For this purpose a small appropriation was made.

Deeply impressed with the importance of this subject, and regarding it as the commencement of a system, which, if properly carried out, will confer incalculable benefits on our common country, I embrace an early opportunity, very respectfully to invite your co-operation in introducing foreign seeds which are rare and valuable.

In calling your attention to this subject, I cherish the belief, that all citizens of the United States, who reside or travel abroad, especially the diplomatic corps, officers and gentlemen of the navy, and commanders of private vessels, will cheerfully, so far as primary duties allow, aid in the measures which the national legislature purposes to accomplish.

Some general directions for packing the seeds, accompany this circular. Please transmit to this office such collections as you may make by public vessels, (as far as practicable) whose commanders are fully authorized to receive the same. Reasonable freight, however, will be paid by this office for shipment in private vessels.

An exhibition of the spike of the different grains, indigenous and exotic, is contemplated in the new Patent Office; hence the importance of sending, if possible, a specimen of the original stalk with the grain attached.

I have the honor to be,
With high respect,
Yours, obediently,
Henry L. Ellsworth.

Directions for putting up and Transmitting Seeds.

With a view to the transmission of seeds from distant countries, the first object of care is *to obtain seeds that are fully ripe, and in a sound and healthy state.* To this the strictest attention should be paid; otherwise, all the care and trouble that may be bestowed on them will have been wasted on objects utterly useless.

Those seeds that are not dry when gathered, should be rendered so by exposure to the air, in the shade.

When dry, the seeds should be put into paper bags. Common brown paper has been found to answer well for making such bags. But as the mode of manufacturing that paper varies in different countries, the precaution should be used of putting a portion of the seeds in other kinds of paper. Those that most effectually exclude air and moisture are believed to be the best for that purpose. It would be proper, also, to enclose some of the seeds in paper or cloth that has been steeped in melted beeswax. It has been recommended that seeds collected in a moist country, or season, be packed in charcoal.

After being put up according to any of these modes, the seeds should be enclosed in a box, which should be covered with pitch, to prevent injury from damp, insects, and mice. During the voyage, they should be kept in a cool, airy, and dry situation; not in the hold of a ship.

The oily seeds soonest lose their germinating faculty. They should be put into a box with sandy earth, in the following manner: first, about two inches of earth at the bottom; into this the seeds should be placed at distances proportionate to their size; on these another layer of earth about an inch thick; and then another layer of seeds: and so on, with alternate layers of earth and seeds until the box is filled within about a foot of the top, which space should be filled with sand; taking care that the earth and sand be well put in, that the seeds may not get out of place. The box should then be covered with a close net-work of cord, well pitched, or with split hoops or laths well pitched, so as to admit the air without exposing the contents of the box to be disturbed by mice or accident. The seeds thus put up will germinate during their passage, and will be in a state to be planted immediately on their arrival.

Although some seeds with a hard shell, such as nuts, peaches, plums, &c., do not come up until a long time after they are sown, it would be proper, when the kernel is oily, to follow the method just pointed out, that they may not turn rancid on the passage. This precaution is also useful for the family of laurels, (laurineæ) and that of myrtles, (myrti,) especially when they have to cross equatorial seas.

To guard against the casualties to which seeds in a germinating state may be exposed during a long voyage, and as another means of ensuring the success of seeds of the kinds here recommended to be put into boxes with earth, it would be well, also, to enclose some of them (each seed separately) in a coat of beeswax, and afterwards pack them in a box covered with pitch.

It may not be necessary, in every case, to observe all the precautions here recommended in regard to the putting up and transmission of seeds; but it is believed that there will be risk in departing from them, in proportion to the distance of the country from which the seeds are to be brought, and to the difference of its latitude, or of the latitudes through which they will pass on the voyage. It is not intended, however, by these instructions, to exclude the adoption of *any other modes of putting up and transmitting seeds and plants, which are in use in any particular place, and which have been found successful,* especially if more simple. And it is recommended, that not only the aid of competent persons be accepted in procuring and putting up seeds and plants, but that they be invited to offer any suggestions in regard to the treatment of the plants during the voyage, and their cultivation and use afterwards.

EXPERIMENTS ON THE POROSITY OF A MASS OF COTTON.

From the Journal of the Franklin Institute.

Perhaps you may consider the following pretty experiment on porosity, worthy of a place in your Journal. Fill a common glass tumbler, or other vessel, completely with some spiritous liquor, so that a few drops more would cause it to overflow. This done, you will find no difficulty in introducing into the tumbler, so filled, *a whole handful of raw cotton.*

This experiment was suggested by the accidental recovery of some wet cotton from a boat which had been sometime sunk in the Tennessee river; it was found by the workmen that after they had squeezed out the water from some cotton, the vessel in which it had been contained, remained nearly as full as before the cotton was removed.

Spirits answers better than water, for trying the experiment, from the rapidity with which they are absorbed by the cotton. Several theories were started by persons who tried the experiment; such as, that the filaments of cotton occupied the vacancies between the globules of water; or that by its capillary action, the cotton subdivided the globules, and caused them to occupy a less space, &c.; to me, however, it appears to be accounted for more satisfactorily, by supposing the fluid to insinuate itself between the filaments of cotton, and thus permit the latter to occupy no more space than is due to their actual solidity. The experiment is certainly a beatiful one.

Very respectfully, yours, &c.,

JOHN C. TRAUTWINE.

Knoxville, Tennesse, June 12, 1839.

ON THE INFLUENCE OF NATIVE MAGNESIA ON THE GERMINATION, VEGETATION, AND FRUCTIFICATION OF VEGETABLES.

By Angelo Abbene.

Among the various causes which produce barrenness in lands, has been enumerated the presence of magnesia, because it had been observed that the various magnesian soils are steril. This opinion has begun to lose credit, since Bergmann, who examined the composition of fertile soils, considered magnesia as forming one of their principal constituents.

Prof. Giobert has performed a number of experiments to inquire into the action of native magnesia, which is found in numerous cultivated soils. In the environs of Castellamonte and of Baldissero, this substance is abundantly diffused in the soils cultivated with great success, and which exhibit a vigorous vegetation. There are many districts in Piedmont and elsewhere, where the bicarbonate of lime and of magnesia is abundant in the cultivated lands, which produce beautiful plants. Giobert concluded from these experiments —1st, that native carbonate of magnesia is not injurious to the various functions of vegetables; 2nd, that on account of the solubility of magnesia in an excess of carbonic acid, this earth can exercise an action analogous to that of lime; 3rd. that a magnesian soil may become fertile when the necessary manure is employed.

From these facts naturally proceeds the conclusion, that if the magnesia was dissolved in an excess of carbonic acid and water, and had entered like the lime into the composition of the sap, it ought to be found in the plants with the potash, lime, oxide of iron, &c. M. Abbene has ascertained this by the analysis of the ashes of plants which had grown in magnesiferous mixture. Moreover he endeavored to find by comparative experiments, whether the influence of magnesia on vegetation is analogous to that of lime. The following are the conclusions he arrives at: 1st. Native magnesia is not only not injurious to the germination, vegetation, and fructification of plants, but, on the contrary, appears to be favorable to these functions. 2nd. Magnesia being soluble in an excess of carbonic acid, has on vegetation an action analogous to that of lime; and when a soil contains magnesia not sufficiently carbonated, this defect may be remedied by the addition of manure, which by its decomposition furnishes the necessary quantity of carbonic acid; the amelioration will be much more efficacious if the soil be frequently disturbed, as then the air will better exercise its action. 3rd. When lime and magnesia exist in arable lands, the former is absorbed in preference by the plants on account of its greater affinity for carbonic acid. 4th. In barren magnesian lands, it is not to the magnesia that the sterility must be attributed, but to the cohesive state of their parts, to the want of manure, of clay, or of other composts, to the large quantity of oxide of iron, &c. 5th. Barren magnesian soils may be rendered fertile by means of calcariferous substances, as rubbish, chalk, ashes, marl, &c., provided the other conditions be fulfilled. —*Jour. de Pharmacie* de Janvier, 1839.

OBSERVATIONS ON THE CULTURE OF THE STRAWBERRY.

By A. J. DOWNING, *Botanic Garden and Nurseries, Newburgh, N. Y.*

From the Genesee Farmer.

The strawberry is certainly one of the most valuable and delicious of all the smaller fruits. It is not only easily cultivated, yielding an abundant crop in a short time, from a very limited space of ground; but while its pleasant sub-acid flavor is agreeable to all palates, and forms one of the most delightful additions to the dessert in summer, it is also extremely wholesome, never, as is the case with most other fruits, undergoing the acetous fermentation. In some diseases it has even been found highly beneficial, and it is affirmed that Linnæus was cured of the gout by abundant use of the berries.

The strawberry, through a low herbaceous plant, sends down remarkably strong roots. In good soils these are often found to penetrate to the depth of eighteen inches or more in a season. It is necessary, therefore, to produce a fine bed, that the soil be deep as well as rich. Where the subsoil is not positively bad, the ground is always much improved by trenching, (two spades deep,) before setting the plants. In doing this, a good coat of manure should be deposited between the two spits: old garden soils which have been long cultivated, are astonishingly improved by this practice, the whole becoming renewed by the presence of the fresh soil; and the growth of plants in such mould, when again acted upon by the sun and air, is of course proportionately vigorous. A deep mellow loam, rather damp than dry, is undoubtedly the preferable soil for this plant; but almost any soil for so limited a species of culture, may, in the hands of a judicious gardener, be rendered suitable for it. We have seen very splendid crops of fruit upon a very stiff yellow clay, mellowed down by mixing with it anthracite coal ashes and manure.

The best season for making new plantations of the strawberry is either in spring, at a pretty early period, or directly after the beds have ceased bearing, in August. If the latter time is chosen, the plants generally get sufficiently well established to bear a considerable crop the ensuing year.

There are various modes in which to plant the beds when formed. Some arrange the plants so as to be kept in hills, others in rows, and others again, allow them to cover the whole surface of the bed. We consider the first method preferable, as in that way the ground can be kept cultivated between the plants; the fruit is generally larger and finer, being more exposed to the genial influence of the sun, and the duration of the bed is greater. Three or four rows may be planted in each bed, at a suitable distance apart, and the runners from the rows should be shortened or cut off about three times during the season. If the plants are not thriving well, a light top dressing between the rows in autumn will be of great advantage. Burning off the upper surface of the bed in the spring has been highly recommended by some persons, but we have never found it to answer our expectations upon trial.

This fruit receives its name from the very ancient custom of placing straw on the beds, between the rows of plants, to preserve the berries clean. The custom is not yet too antiquated to be of less value to those who desire the fruit in its greatest perfection. Clean wheat or rye chaff may be substituted for straw, and it has the very great additional advantage of not only preventing most weeds from growing, by excluding the light, but also, by decomposing with considerable rapidity after the fruit season is past, it contributes much to the enrichment of the surface soil of the bed. Young and strong runners well rooted, should in *all cases* be chosen to form the new bed, and not *old plants*, or those offsets which grow near them.

There is a fact with regard to the strawberry plant little known, the ignorance of which puzzles many a good cultivator. This is the existence of separate fertile and steril or barren plants in many of the varieties, otherwise plants which produce chiefly male, and others that produce only female flowers. Botanically, the strawberry should produce both stamens and pistils in each flower, and the blossoms should consequently all mature fruit. This is really the case with the alpine, the wood strawberries, &c., but not entirely so with the large scarlet and pine strawberries. These latter sorts, it is well known, produce the largest and finest fruit; but we very often see whole beds of them in fine flourishing condition, almost entirely unproductive. The common parlance in such cases is that the variety has run out, or degenerated; but the idea is a confused and ignorant one, while the healthy aspect of the plants fully proves the vigor of the sort.

The truth is, that in all strawberries of the foregoing classes, although each blossom is furnished with stamens and pistils, yet, in some plants the pistils are so few that they can scarcely be perceived; in others, there are scarcely any stamens visible. When the plants bear blossoms furnished with stamens only, (or in a large proportion,) they are of course barren; when pistils only are produced in abundance, they are fertile. To have a bed planted so as to bear abundantly, about one plant in eight or ten should be staminate or barren blossoming plants; the others the fertile ones—for if the latter only be kept, they alone will also be found unproductive.

If any person will examine a bed of the Hudson or any of the large scarlet strawberries, when they are in blossom, he will discover a great number of plants which bear large showy blossoms filled with fine yellow stamens. These are the barren plants. Here and there, also, he will discover plants bearing much smaller blossoms, filled with the heads of pistils, like a small green strawberry. The latter are the fertile ones. Now the vigor of the barren plants is so much greater than that of the fertile ones, and their offsets are so much more numerous, that if care be not taken to prevent this, they soon completely overrun and crowd out the fertile or bearing plants, and to this cause only is to be attributed the unproductive state of many beds of the large fruited strawberries, which are in many instances perhaps, entirely devoid of fertile plants.

The proper method undoubtedly is to select a few fertile plants of each kind, plant them in a small bed by themselves, and allow them to increase freely by runners; then, on planting, the proper proportion could be made and kept up by the regular clipping of the runners.

Many of the fine English varieties of strawberry, (Wilmot's superb, for instance,) are generally found worthless here. This is owing, in some cases, to the ignorance or want of care of those persons who export the varieties, in sending often, no fertile plants; in other instances, it is equally owing to our negligence here, in not preserving the due proportion of barren and fertile plants.

This peculiarity in the blossoms is very little known or understood, even among scientific cultivators. It was first pointed out to us by our esteemed friend, N. Longworth, Esq., of Cincinnati, one of our most distinguished western horticulturists. Its truth we have repeatedly verified, and a slight examination will convince any person of the cause of the numerous worthless yet thrifily looking strawberry beds throughout our gardens.

The finest of the large English varieties of this fruit which we cultivate here is the Bishop's. It is remarkably large, a most abundant bearer, and of superior flavor. Many of the larger berried sorts, as the Methven Castle, have been hollow and comparatively tasteless, though of uncommon size. This variety, however, appear to us to unite all that can be desired, to constitute a truly fine and delicious strawberry. A. J. D.

INSECT DEPREDATORS.

From the Genesee Farmer.

Of the insect tribes there are many that occasionally prey on the vegetables produced by human labor, some making their appearance at one season, or in some particular year, while others are irregular in their visits, and at times disappear for years in succession. Occasionally, too, new depredators make their appearance, or as is most probable, first attract notice by the mischief they produce. Some insects feed only while in the larva state, and hence the mischief they occasion is performed while in that stage of their existence. Others spend their larva state inactive; but while existing as perfect insects, are most destructive; while a few are injurious in both of these states. Thus it is, the larvæ of the Hessian fly, the cut grub and army worms, that occasion such loss to the farmer; while the chinch and rose bugs, the grasshopper and locust, are injurious only while they live as perfect insects. A knowledge of the history, habits, periods of existence, and depredations of the most formidable insect depredators is very necessary to all classes of cultivators, and we may be permitted to hope that this desideratum will be supplied by the gentlemen who are now, by authority, engaged in investigating the entomology of some of the principal states.

Few years pass, in which, on the whole, more injury is not sustained from these pests of agriculture, than has occurred in the present. Some districts have, it is true, suffered severely, but the insect visitation has not been general, or unusually destructive where it has occurred. The three principal depredators of the present year have been the Hessian fly, the chinch bug, and the army worm. The first of these has scarcely been noticed, and has produced no injury worth mentioning, except on the tide water districts of the middle and southern states. Here it was very prevalent, and for a time created much alarm. At harvest, however, the damage, though considerable, was found to have been overrated; the very fine weather bringing the crop forward in spite of the fly. It has hardly been mentioned north of the Delaware. The chinch bug is peculiary a southern pest, very destructive to crops, and its origin, habits and transformations, judging from the little we have been able to find respecting it, does not appear to be at all understood, even in those districts where it is most prevalent. These districts are what may be called the first table lands of the south, or those lying between tide level and the first ranges of highlands. It is described as making its appearance in immense numbers in the woods, from which it spreads in every direction, attacking indiscriminately wheat, corn, and indeed the most of the cultivated grains and grasses. No method as yet has been found effectual to arrest their progress. Though provided with wings, they rarely use them, but march forward on the earth, feeding on whatever attracts them during their progress. Their disappearance is as sudden as their appearance, and apparently equally involved in mystery. An investigation of the habits of this insect is well worthy the study of the southern man of science, as its frequent appearance, and the loss it occasions, render it a formidable enemy to the farmers of the districts in which it most prevails. The army worm is the name given to the larva or caterpillar produced by some one of the countless family of the moths, though what one, does not yet appear to have been ascertained. It has received its name from the numbers in which it appears, the seeming order and regularity of its movements, and its destructive voracity. Wherever it appears, and whichever way the dense masses are directed, vegetation disappears with astonishing celerity. Before, is the garden of Eden; behind is a desolate wilderness. The present season it has done much injury in Illinois, parts of Indiana and Michigan; and a few have appeared west of the Mississippi. A few years since it committed fearful ravages in Ohio. No accurate description of this depredator appears to have been published; and for the purpose of aiding in calling attention to the insect in question, we should be much gratified if some of our subscribers in those districts where it is, or has been most abundant, would furnish us an account of the worm, its appearance, ravages, the miller or moth that produces it, if known, or any other particulars that may be interesting in elucidating its character and history. The only method of checking the march of this insect yet discovered, is to plough a deep furrow across the line of progress, or around the field to be preserved from them, keeping the sides smooth with the hoe, and the worm falling into this furrow, is unable to escape, and perishes. The numbers so destroyed in a single trench, is almost incredible.

AGRICULTURAL GEOLOGY.

From Prof. Jackson's Third Report on the Geology of Maine.

As I have formerly stated, it is evident from an examination of the mineral ingredients of soils, that they *all originated from the decomposition and disintegration of rocks which for ages have been acted upon by air and water;* those agents having, by their mechanical and chemical powers, shivered and crumbled the solid ledges into those pulverulent matters which form the basis of all soils—to which, subsequently small quantities of vegetable humus are added by the decay of plants.

Ancient soils. There have been various epochs in the earth's history, when soils were thus formed, and after bearing their luxuriant vegetation, were reconverted by aqueous and igneous causes, into rocks, the structure, and fossil contents of which, denote ther origin to have been from sedimentary matter,hardened by pressure and heat. Thus, when we look back to the epoch of the transition formations, we find the rocks composing that series to be composed of agglomerated sand and pebbles, cemented by clay, which presents itself in an indurated form, the result of igneous action. Marine shells, contained in the grauwacke rocks just described, evince that this deposit was chiefly formed beneath the waters of the sea, while some portions of it were deposited in fresh water, as proved by the presence of certain plants, peculiar to bogs and lakes. The slates of this formation contain prints and casts of numerous plants—such as ferns, equisetaceæ, lepidodendræ and stigmaricæ; while beds of anthracite coal showing by their structure and composition their vegetable origin,are also included between the strata.

Now it is evident, that the above mentioned plants could not have grown without a soil, and the rocks in whch they are imbedded bear every proof that they were once in that condition.

Secondary soils. We come next to the secondary epoch, and here again we are astonished to find proofs of a numerous succession of alternating beds of soil, each having, for long periods of time borne their perennial verdure of intertropical plants, allied to those above noticed, but more complicated and perfect in their structure. The sandstones and shales of this formation are vast herbaria of ancient vegetation, and their strata contain, well preserved between their sheets, perfect impressions of numerous genera of plants, the species of which are now extinct. Large trunks of trees are also exposed by opening coal mines and quarries of sandstone, while the numerous and reiterated strata of coal itself also bear ample proofs of their vegetable origin.

Here, then, we have another epoch, at which soils existed, produced their abundant vegetation, stored the earth with fuel, and then were reconverted into solid rocks, to be again subjected to the wear and tear of elemental strife.

The *tertiary epoch* was of a milder .character and but little disturbance of the solid rocks appears to have been effected during those submersions, when the plastic clay, calcareous marls and strata of perfectly preserved marine shells, were deposited. These sedimentary matters appear to have resulted from a slow and gradual deposition of clay and other fine sedimentary matter, which beneath the sea, became soon inhabited by numerous shell fish, and were imbedded in succession as we now find them, since the elevation of the land above the encroachments of the sea.

When we consider the several periods which I have briefly mentioned, it will at once reveal to any reflecting persons, that the world has been during the lapse of inconceivable ages, subject to great revolutions in its geological organization. At one time, the rocks are worn down into soils, and bear their vegetation—then continents were sunk in the ocean's depths, and subsequently were raised again, the soils having in the mean time been converted into rocks. By such consideration, we soon learn to respect the antiquity of the world; and knowing that such records are legibly written on the tablets of stone, we feel a natural desire to read and understand their meaning.

Ancient alluvial soils, or diluvium. Subsequent to the epochs of which I have spoken, we find that another scene of violence disturbed the tranquility of the great deep, and the northern ocean was hurled, with its seas of ice, over the land, sweeping the loose materials from the very mountain tops, and depositing them far south of their former resting places—while the grooves, scratches and water marks upon the surface of the fixed ledges, show the direction in which the current passed. By such a flood, (proofs of which are nearly universal in Maine, as elsewhere,) the soils were transported and commingled, so that we rarely find a soil similar to the rocks beneath it, but identical with that derived from other rocks which occur to the north and northwest. Having already cited so many localities in proof of this position, I shall not here recapitulate, and the intelligent observer will find so many illustrations in Maine, to satisfy his rational curiosity on the subject, that he need not long remain in doubt as to the facts.

Modern alluvial soils. The present causes which act upon the solid rocks, are both chemical and mecanical. Oxigen,from the atmosphere and from water,is constantly affecting some portions of the work, especially where the rocks contain pyrites. Rivers, torrents, brooks, and even rain, are gradually sweeping away the solid rocks, by their continued action ; but more powerful than all others, is the action of freezing water, which, by an almost irresistibly expansive force, rends all rocks into which water can find a passage; and crumbles down those which are porous in their structure. Upon the coast, the sea ever beating the solid rocks and hurling the loose fragments with the force of battering ordnance against the shores, wears away the ledges, the detritus being either spread out on the bottom, or silted up at the mouths of harbors and estuaries.

Alluvial soils are produced by the transportation of fine particles, by aqueous agency, from higher sources, and are especially brought down and deposited during freshets, when a river bursts its confines, and being diminished in its velocity, deposits its sedementary matter over the intervales. The force of the wind is also constantly removing fine particles of soil from one district to another, and the dust of ages is of greater importance than is commonly believed. Enough has been said on this subject to excite inquiry, and to stimulate others to look over the pages of nature, for their own satisfaction, and this is all that can be expected from introductory remarks, such as I now offer to the reflecting observer.

It must not be expected that any one locality is to furnish all the data for the elucidation of a general theory; but a discriminating eye will quickly select such as may bear upon the subject in question. Books, relating the observations and experience of others, should also serve to guide those who may engage in this study.

THE TOMATO PLANT A PROTECTION FROM CHINCH-BUG—AND BUCKWHEAT FROM THE TURNIP FLY.

To the Editor of the Farmers' Register.

Indian Creek, *Lancaster*, *Aug.* 7*th*, 1839.

The chinch-bug has made its appearance in this county, but too late I hope to injure very materially the growing crop of corn, which is now, by far the most promising I have ever seen in this region. If this little insect is as destructive as it has been represented to be, to wheat, oats and corn, should I live to the next seeding and planting season, I for one shall seed and plant with serious apprehension of reaping and gathering a short crop. Perhaps I have done wrong to entertain and express such apprehension, I write as if I had forgotten there is an all-wise and omnipotent being who never uses his chastening rod but for the good of his intelligent creatures; and I am convinced when the destructive insect has done that "whereunto it was sent," it will disappear, and not till then, and that there is a "thus far" for it to go, and "no farther." But, sir, while I entertain this opinion, I feel it to be my bounden duty to use every means to repel this destructive invader of our fields. So far as I am informed all efforts heretofore made have had no good effect. A *fact* was a few days part stated to me by a gentleman of this county, which I think ought to be communicated to you as the editor of a valuable agricultural paper, in order that the information may be made general. The gentleman alluded to last spring carried out and manured a piece of ground with ashes and scrapings from around his kitchen and yard, in which were a quantity of tomato seed that vegetated; in working his corn he left standing between the hills of corn plants on about an acre of land; now the *fact intended* to be communicated is, that in all this acre of land not one stalk of corn has been touched by the chinch-bug, while all around about has been fired or rather sucked dry by this insect. About two acres were manured with ashes and scrapings, and the gentleman thinks the tomato plants alone protected the corn among which they grew, there being no difference in the land, or quality or quantity of the manure applied. I mentioned this statement to a gentleman in Northumberland, who seemed to be at once convinced that the tomato plants protected the corn, for said he, "I know that the little bug which is so destructive to cucumber vines will never show itself on them if tomato plants are growing among them." I have thus, sir, made to you the above statement to use as you please. But I do not stand sponsor for the tomato plant.

As the turnip sowing season is near at hand, I will mention (as worthy of notice at least,) that a gentleman residing not far from Baltimore told me that to mix or sow a small portion of buck wheat with turnip seed would certainly prevent the fly (which is often so destructive to early sown turnips) from injuring them. He said that the fly greatly preferred feeding on the buck wheat, and would not touch the turnip as long as there was any wheat for it to feed on.

Respectfully yours,
Ralph Edmonds.

SAVING CLOVER SEED.

From the Franklin Farmer.

The difficulties of saving the seed are imaginary; the process is simple and easy. After the clover field has been cut or grazed, let the second come on. When about two-thirds of the heads have turned brown, cut with a cradle, throwing the grass into double swaths, and cure. When cured, rake up in the morning while the dew is on, into convenient parcels for loading with a pitchfork, and, as soon as all danger from heating is obviated, get it under shelter, either in the barn, or protected in the field. Be careful not to put it away while any moisture remains in the plants; and on the other hand, don't handle it rudely when very dry, where you don't want the seeds to fall, for in that condition the heads spend freely. Having sheltered it, you may wait, if you choose, till winter affords leisure for thrashing or treading out. Sow in the chaff, as it is more certain than the cleaned seed. A bushel in the chaff will abundantly seed an acre; but we would advise the mixture of blue grass, timothy, and orchard garss with it. We shall say more of sowing, however, at more seasonable date.

The second crop produces more seed than the first, and hence the economy of the first cutting or grazing the field; though from that cut for hay, a prudent, careful husbandman might easily save enough seed for his own use. It is believed that more seed may be saved by mowing when about two-thirds of the heads have turned brown than at any other period, because, if cut sooner, too many seeds are unripe, and if later, too many shatter out of the heads in cradling and handling. If the heads break off and fall through the fingers in cradling, cover with cotton or linen cloth. Every farmer may easily save his own seed.

MANURE FROM PEAT AND LIME.

From the Third Annual Report on the Geology of Maine.

Peat also occurs abundantly in the same meadow, and by a little chemical skill may be converted into an excellent manure by means of a mixture of lime and a little barn-yard manure, or any animal matter. Thus three or four cords of the peat mixed with one cord of animal manure, and treated with a cask or two of slaked lime, will make a compost superior in value to five cords of the best stable manure alone. They ought to be placed in alternating layers, thus:

PEAT,

LIME,

ANIMAL MANURE,

PEAT,

&c.

The whole forming a regular compost heap. The chemical reactions which follow are chiefly thus:

The lime extricates a large quantity of gaseous ammonia from the animal matter, which is absorbed by and enters into combination with the peat, and is thus retained ready for use in the state of ulmate or geat of ammonia—(a most powerful manure)—and the lime becomes completely carbonated or air slaked by the carbonic acid given out during fermentation, and in this state is a proper and permanent ameliorator of the soil. The peat is converted into a powder and soluble pulp, and becomes more suitable for the nutriment of plants. While if lime and animal matter was used in excess we shall have also a considerable quantity of carbonate of ammonia, in the peat, a well known and powerful saline manure.

In case the soil is sandy, the clay marl, neutralized with lime, is the most proper amendment for it, and such is generally the condition of the fields in Saco, so that by a proper use of this marl the happiest effects may be realized by the farmers in that town.

I could quote other instances of the kind, but the above fully illustrates my meaning, and will show how favorable an influence scientific knowledge would exert in agriculture, were it more generally appreciated.

The principles which I have laid down, have been adopted by several distinguished farmers of Massachusetts, and their experience most fully corroborates the truth of the theory inculcated.

I need but appeal to the experience of one of our most intelligent farmers in Massachusetts, Elias Phinney, Esq., of Lexington, to demonstrate the correctness of the rules we have laid down, with regard to the use of peat for compost manure, or to the beautiful farm of Benjamin Bussey, Esq. of Jamaica Plain, Roxbury, where similar results have been obtained.

Lexington, January 30, 1830.

"Dr. Charles T. Jackson,

"*Dear Sir*:—I herewith send you a sample of my peat. I am very desirous of availing myself of the benefit to be derived from a chemical analysis of the same, which you kindly offered to make. A more intimate knowledge of the nature and properties of peat, which can be obtained only by a scientific examination of its constituent parts, would enable farmers more justly to appreciate this valuable species of land. It is from a want of this knowledge, that our extensive tracts of low meadow and swamp lands have hitherto been esteemed of little, or no value. Allow me to say, sir, that I know of no way, in which you could render a more essential service to the public, more especially to farmers, than by enabling them to convert their unproductive and unsightly bogs and morasses into luxuriant fields, and sources of wealth. I consider my peat grounds by far the most valuable part of my farm, more valuable than my wood lots for fuel, and more than double the value of an equal number of acres of my uplands, for the purposes of cultivation.

"In addition to these, they furnish an inexhaustible supply of the most essential ingredient for the manure heap. A statement of the uses, to which I have appropriated peat lands, and my management of them, though very imperfect, may serve to give you a partial conception of their value and uses, and at the same time enable you to see how important it is that the farming community should have more information on this subject.

"In the first place they are valuable for fuel. I have for twenty years past resorted to my peat meadows for fuel. These, with the prunings of my fruit trees, and the brush from my uncleared lands, have given me my whole supply. The prunings and brush are bound in bundles, and housed, and with the help of a small bundle of these faggots, and peat, a quick and durable fire is made. It gives a summer-like atmosphere, and lights a room better than a wood fire. The smoke from peat has no irritating effect upon the eyes, and does not in the slightest degree obstruct respiration, like the smoke of wood; and it has none of that drying, unpleasant effect of a coal fire. The ashes of peat are, to be sure, more abundant, but not more troublesome, and are less injurious to the furniture of a room, than the ashes of coal.

"The best peat is found in meadows, which have for many years been destitute of trees, and brush, and well drained, and where the surface has become so dry, and the accumulation of decayed vegetable matter so great, that but little grass or herbage of any description is seen upon the surface. If the meadows are suffered to remain in a wet and miry condition, the wild grasses and coarse herbage will continue to grow, and the peat be of a light and chaffy texture, filled with undecayed fibrous roots. By draining they become hard, and the peat becomes compact and solid, and the cutting out, and carrying off greatly facilitated. A rod square, cut two spittings deep, each spitting of the length of eighteen inches, will give three cords when dried. It may be cut from May to September. If the weather in autumn be very dry, the best time for cutting will be from the middle of August to the middle of September. If cut the latter part of summer, or early in autumn, it dries more gradually, and is not so liable to crack and crumble, as when cut early in summer. The pieces are taken out with an instrument made for the purpose, from two to three inches square; and if of good quality will shrink about one-half in drying. It is considered a day's work for a man, a boy and a horse, to cut out and spread a rod square. The man cuts it out, and lays it upon a light kind of drag, made for the purpose, and it is drawn off by the horse, and spread by the boy as thick as the pieces can lay singly. After becoming dry enough to handle without breaking, it is made into piles, cob-house fashion, of from twelve to twenty pieces in a pile. It will then require about four weeks of dry weather to render it fit to be housed for use. The top, or turf, is thrown back into the pits, from which the peat is taken; and if well levelled, and the ground drained, it will, after the first year, give a large crop of foul meadow, or other lowland grass. Peat, taken from land which has been many years drained, when dried, is nearly as heavy as oak wood, and bears about the same price in the market.

"The value of peat and swamp lands for tillage, is now pretty well known, and acknowledged. Some years since, I occasionally sold to my neighbors a few rods of my peat land, yearly, to be cut out for fuel, at three dollars per rod, being at the rate of four hundred and eighty dollars per acre; but finding this sum to be less than its value for cultivation, especially when laid to grass, I have declined making further sales at that price. I have raised upon my reclaimed meadows, seventy-five bushels of corn, five hundred bushels of potatoes, or from four to five tons of the best hay, at a first and second cutting, to the acre, at a less expense of labor and manure, than would be required to produce half this crop upon uplands. To render these lands productive, they should be thoroughly drained, by digging a ditch around the margin of the meadow, so as to cut off the springs, and receive the water, that is continually flowing in from the surrounding uplands. If the meadow be wide, a ditch through the centre may be necessary, but this will be of no use without the border ditches. This being thoroughly done, and the surplus water all drawn off, the next step is to exterminate the wild grasses, and herbage of every kind, that grow upon the surface. To effect this, the method heretofore generally, and now by some pursued, is to cover with gravel or sand, top-dress with manure, sow the grass seed, and then rake, or bush it over. This, for the first year or two, will give a good crop of hay; but after this I have invariably found that the more coarse and hardy kinds of wild grass would work their way through the sand, or gravel, and entirely supplant the cultivated grasses—when the whole must have another covering, or be abandoned as worthless. If to be planted with corn, or any of the root crops, my course has been to turn over the turf or sward with a plough having a wrought iron share or coulter, ground to a sharp edge in the driest season, say in the month of September, roll down as hard as possible, carry on in the winter a sufficient top dressing of compost, twenty cart-loads to the acre, and in the spring plant with corn, or roots, without disturbing the sod. When the corn or roots are taken off, the surface is made smooth with the cultivator, or hoe and harrow, and late in November, or just before the heavy frosts set in, sow with herd's grass and red-top seed, half a bushel of the former and one bushel of the latter to the acre. The field is then rolled, which completes the process. If the plough does not turn the sods smooth, it will be necessary to follow it with the bog hoe, to level the uneven places. By keeping the sod undisturbed in the cultivation, a more firm and compact surface is formed, upon which oxen or horses may work, generally, without danger of miring. If the land is intended for grass, without the intervention of a hoed crop, the turf is turned over with the plough, as before stated, in August or September, or as early as the surface becomes dry enough to admit the oxen or horses upon it; then follow with the bog hoe, and turn over such parts as the plough has left unturned, make the whole smooth with the hoe, and late in November, spread on a top-dressing of compost, not less than twenty cart-loads, made half of loam, and half of stable manure, to the acre; then sow the grass seed, and bush, and roll down. If the ground be miry, so as to render the use of the plough impracticable, the bog hoe must be resorted to, and the whole turned over by hand, and top-dressed, and seeded to grass, as above stated. The cost of turning over with the hoe, will be twenty dollars per acre, at the usual price of labor. This mode of culture completely subdues the natural wild grasses, and gives a compact and rich surface of vegetable mould, which will give an abundant crop of the best English hay for four or five years, without the aid of more manure. If the sod is disturbed and attempted to be pulverized in the course of the cultivation, the surface, when laid to grass, will be loose and spongy—and extra top-dressing of loam and manure will be required, and after all, the surface will not become so compact, nor the produce by any means so great. Should meadows be found too soft and miry to admit of their being ploughed in the summer, or autumn, and the expense of turning with the hoe should be thought to be too great, I would advise ploughing in the spring, when the frost is out, to the depth of three or four inches, carting on the manure, and then sowing or planting at a convenient and proper season. The art of reclaiming these low meadows, consists in taking off all the surplus water by judicious draining, and in thoroughly exterminating the natural herbage and grasses. This being effected, we have our rich bottoms, equally as productive as the deep alluvials of the west, and obtained at a cost and sacrifice infinitely less.

"The third particular, in which peat lands may be considered valuable to the farmer, consists in furnishing him with a very important ingredient for his compost. Peat is made up principally of decomposed vegetable substances, with a portion of the lighter particles of vegetable mould, washed in from the surrounding highlands. But when taken fresh from the pit, it contains certain antiseptic properties, injurious to vegetation, which must be absorbed, or neutralized, by a combination with other substances, in order to render it food for plants. This may in some measure be effected by exposure to the action of the air and frost. Where the surrounding uplands are composed of gravel or sand, the peat or swamp mud may be called silicious, and is less valuable for manure, especially if the adjacent uplands rise abruptly; when composed principally of clay, the peat is aluminous—this is frequently found resting on beds of marl, and is considered much richer, and more valuable for the compost heap.

"I have annually, for some years past, used on my farm some hundreds of loads of peat mud, which is either thrown into my hog stye, or mixed with fresh stable dung, or with lime. When mixed with green stable manure, the proportions are two parts of peat mud to one of dung; and I am confident, from repeated experiments, that a load of this compost, well mixed and fermented, will give as great a produce, and a more permanent improvement to the soil, than the same quantity of stable manure. In this opinion, I am not alone. Other accurate and intelligent cultivators, have made similar experiments with similar results.

"The vegetable substances of which peat is composed having been decomposed in stagnant waters, they have not passed through a putrefactive fermentation, and are therefore supposed to retain much of their natural oils, gums and acids. Peats, in this region, are also supposed to contain portions of sulphate of iron, or copperas, oxide of iron, &c. This opinion is formed from noticing the difference between the effect produced by using the peat mud on ground, when first taken out of the meadow, and that which is produced after fermentation, with stable manure, or by mixing it with lime. The ashes of peat have little or no perceptible effects, when used alone, but by mixing them with lime, they become a valuable manure.

"That our peat may possess other and different properties, which are in a great or less degree injurious to plants, is highly probable. These can be detected and remedied only by the aid of science. It is to the agricultural chemist, that the practical farmer must look for a developement of his resources, to remove the obstacles which impede his progress, and to impart that information which will give confidence to action, and a successful issue to labor.

"With an earnest desire that you may persevere in your useful labors,

I am, dear sir,
With the highest respect,
Your obedient servant,
E. Phinney."

Having, two years since, given Dr. N. C. Keep some instructions, relating to the management of peat compost, that gentleman communicated them to his father, an old and intelligent farmer, residing at Longmeadow, upon the Connecticut river; and the experimental trial having been made to his satisfaction, he politely furnishes me with the following interesting statistics:

"To Charles T. Jackson, State Geologist, &c.

"*Dear Sir*:—Being much indebted to you for information in regard to the use of peat, as a manure, and the mode in which its acid properties may be not only neutralized, but made a most valuable food for plants, I beg leave to state, that in the fall of 1836, I took from my bog about three cords of peat, and placed it in a pile on the nearest solid land, in the woods. It remained there undisturbed until sometime in November, 1837. By the action of the *frost* of the preceding winter, and the heat of the summer, it had lost much of its adhesive property, and was greatly reduced in weight.

"I now brought it home, and while one was unloading, another sifted in lime with the hand, (it having been previously slaked to a fine powder,) at the rate of one bushel to a cord of peat. Lime having been thus scattered evenly through the whole mass, nothing further was done to it until about the middle of next May. Observing, after the manure had been removed from the barn yard, that a considerable quantity of water from the rains had collected itself in the lowest part of the yard, (say six or eight barrels,) I had the peat removed into it. The garnet-colored wash of the yard was rapidly and entirely absorbed. I allowed it to remain in this situation until the first of June, during which time its color had changed from mahogany to a jet black. Fermentation did not take place.

"By the successive action of the frost, lime, and the wash of the yard, the sensible qualities of the peat had very much changed. When first taken from the bog, it was pulpy and very adhesive—could be spread like butter; now it was a fine powder, having entirely lost its peculiar adhesive properties.

"I used the manure thus prepared, for squashes—planting fifteen rods of ground, very sandy and much exposed to drought. After the manure had been dropped, (one shovel full in a hill,) I sprinkled a little lime in each hill, directly upon the peat. Upon this, I planted the autumnal marrow squash. The seeds came up well, and the plants were of a healthy color. Some of the plants were entirely destroyed, and all of them badly eaten by insects; the yellow bug was most destructive. The plants, after they had recovered from this shock, grew more rapidly than any that I had before witnessed. The color of the vines, and the rapidity with which they covered the ground, were most convincing proofs to my mind that they were perfectly healthy, and well supplied with nutriment. In the severe drought which came on in the summer, these vines, for many weeks, did not appear to suffer, while others of a similar kind in the neighborhood, were dead and dying. The result was, that notwithstanding the long continuance of the drought, in which nearly all our potatoes, peas, &c, were killed, these squashes were preserved, and yielded a middling crop.

"I also used the compost, as above, on intervale land, near the Connecticut river, soil alluvial, no stones or gravel—can be easily compressed, does not bake in the sun—has been cultivated for more than one hundred and fifty years, and yields a very scanty crop, without manure. The compost was spread over the ground, and ploughed in, at the rate of nine cords to the acre of ground; thus prepared, I planted thirty rods with sugar beets—distance between the rows, eighteen inches—hills eight inches—one seed in a hill. The seeds proved bad, not more than one-third coming up—yet I had 116 bushels of beets; while above an acre of the same land, manured with the best stable manure, at the rate of twelve cords to the acre, did not produce one hundred bushels. Two rows of potatoes were planted next the beets; the land had been designed for beets, and was prepared precisely the same. Between these two rows and more than an acre immediately adjoining, (where a large quantity of best barn-yard or animal manure was used,) there was a very perceptible difference in favor of the former. I also planted a few hills of potatoes on very sandy land, in the latter part of June. Into the hills I put peat, which had been saturated with lye, from the bottom of a soap tub—no lime. The tops of these potatoes, during the whole drought, were of the most living green and the most luxuriant growth that I ever beheld. They were killed by the frost in the fall, before maturity. The potatoes were small.

"In conclusion, I would mention, that I am so well pleased with the result of these experiments on a small scale, that I am now preparing one hundred and fifty cords of peat, and fifty casks of Camden lime, and all the animal manure I can make, to enrich as fast as possible my whole farm.

"*Expense.* I get out my peat by ox-team and cart. Three men can, in this way, get out eight cords per day, $4.00; price of lime, $1.50 per cask. My peat being three and a half miles from my barn, that portion of it which I bring home, I estimate to cost me, for carting, one dollar per cord. The peat and the lime for the compost—using one third of a cask of lime to a cord of peat—then, cost me, on the ground near the peat bog—three cords of peat, $1.50—one cask of lime, $1.50; that which I cart home, $1.00 per cord more.

"I intend to put about one-sixth part of animal manure, but as it cannot be purchased in any adequate quantity, it is more difficult to fix a price. The nearest place where livery stable manure is sold, is four miles; price there, per cord, $3.00—cost of carting, $1.50,

Five cords of peat, delivered, -	$7.50
Two and one third cask of lime delivered,	3.50
One cord livery stable manure, "	4.50
	$15.50—

divided by six—the number of cords, not estimating the increase of quantity from the bulk of the lime—gives the cost, two dollars and fifty-eight cents, delivered—or one dollar and fifty-eight cents per cord, at the peat bog.

(Signed) SAMUEL KEEP.

"*Dear Sir*:—Herewith are the facts, collected with care, at my request, by my father, Samuel Keep, of Longmeadow. My own opinion is, that a new era has begun in agriculture. The quantity of one-third of a cask of lime to a cord, was selected in the absence of chemical experiments, to determine how much was absolutely needed to neutralize the ulmic acid, because he prefers to put on ten to twelve cords to the acre—and twelve cords would take four casks of lime to the acre. If lime was as cheap as in Maine, he would probably have put in more. Notwithstanding the expense appears to be great, my father feels confident that he gets a better article in compost at $2.58, than the livery stables furnishes at $3.00, with the additional cost to him of $1.50 for carting, making $4.50.

N. C. KEEP."

THE CANTON MULBERRY.

To the Editor of the Farmers' Register.

In my estimate of the comparative value of several varieties of the mulberry, which recently appeared in the Farmers' Register, the Canton occupies the third place. As its growth advances, however, it appears to be more valuable, and I am constrained to place it next to the morus multicaulis. It grows very rapidly, is easily propagated from cuttings, and its leaves are about three-fourths the size of those of the multicaulis. This mulberry I procured from Mr. J. Mason, Jr. of George Town, D. C. and by a letter recently received from him, I am informed that he has some of this variety from roots, 8 feet high, and from cuttings but little inferior. I presume they were planted on very rich soil; but its chief value in my view, consists not merely in its large leaves, but in its adaptation to poor soils. Any mulberry which does not possess the latter quality will not suit a large portion of Maryland and Virginia. My object in writing is to circulate correct information, and whenever I find that I have promulgated an error, I hope I shall always possess the frankness to acknowledge it.

LAYTON Y. ATKINS.

Stafford, August, 1839.

We had received previously from another highly respectable source a commendatory article on the Canton mulberry, which we had declined inserting, because, first, one such, to the same general purport, had before been published, and secondly, lest the piece might have been supposed to be a salesman's advertisement in disguise—which we would be unwilling should be charged against any article in this journal. A place for the foregoing piece is claimed, and of course conceded, on the ground of justice, and for the correction of previous error of the writer.—ED. F. R.

SOILS ENTIRELY OF LIME.

To the Editor of the Farmers' Register.

A valuable communication on the subject of *lime*, one of the most interesting to the agricultural community in your Register for June, has induced me to give you two *facts* relating to that species of manure, stimulant, or whatever it may be termed. The first five or six lines of the above communication induced me to believe it would be a proper moment to give them to your readers. Along the coast of the Gulf of Mexico, the bay of Mobile, and reaching up into the mouths of the rivers emptying into each, there are formed extensive *marshes*, and islands entirely so. On those marshes we frequently find, what are termed *shell banks*. Those banks are at distant periods covered with water, and a deposite of *black earth* is found more or less amongst the shell which is uniformly more or less mouldered. Some of those banks are not covered for many years, and in this case indicate but little earthy matter amongst the shell. Opposite the town of Mobile one of those banks is found considerably elevated; no person now living knows when it was covered with water. Containing about one and a half acre, it rises like an old remains of a mound. It has been cultivated for many years; when not cultivated, throws up a singularly rank grass; no spot of soil on the Mississippi or in Ohio, Kentucky, &c., can exceed it in producing *annual vegetation* of any and every plant—beets, cabbage, corn, or sugar cane. Now all persons who have examined it are perfectly satisfied that there cannot exceed *one-tenth of earth*, or *deposite amongst the lime* or *shell*; the last, when put through the usual process makes the strongest lime.

In my yard stands *a mass of blocks* of that species of calcareous matter usually called here, and in Georgia, where it abounds, "*rotten limestone*," the basis of the *prairies*. On the top, and sides of this mass, which has been exposed to the atmosphere, say twelve months, and considerably *pulverized* by the last winter's frosts and the rains of the season, is found at this time a growth of the *common turnip* from one to three inches diameter. To talk of any *earth* being amongst the rotten limestone would be absurd.* Amongst the *turnips* is found *cabbage*, and the common *white mustard*, growing well. I give you the *facts* as they are seen every day; and I confess I have been induced to give them on reading communications containing *doubts* of *lime* containing any of the qualities of an actual *manure*, and especially of those who contend it has no such qualities.

AGRICOLA.

PROMISCUOUS.

For the Farmers' Register.

Theory.—Amongst my readings on farming subjects, I frequently notice objections to theory; at which I am much astonished, for without theory there can be no practice. For my own part I am equally fond of theory and practice; if the theory is good, I put into practice, and if the practice is good, I continue it.

Practice.—My practice is to carry paper and pencil in my pocket, and as an idea which I may consider of value occurs, I make notes; to which notes the public are welcome, as they cost me nothing.

Brake or fern.—In a late number of the 'Cultivator,' I noticed the inquiry "how shall I destroy fern?" which was answered "I do not know, except by eradication." There are several species of fern, some of which grow in warm climates and situations; but there are two kinds in Virginia which are considered pests, which grow only in and amongst the mountains; one a pest in the woods, and the other a pest in the fields. That which grows in the woods arrives to the height of five feet or more, and may easily be destroyed by felling or belting the trees, provided the sunshine is thereby insured; but a thorough burning would be a great auxiliary in this case. That kind which grows in fields is found about stumps, rocks, logs, fences, and branches, and if not destroyed will presently take possession of a greater space than the landlord can conveniently spare. Sheep will feed partially on this fern, although other and better food may be abundant, and I suppose it is not much disliked by any animal; now suppose brine, or fine salt be sprinkled on this fern, when cows or sheep, or both, are pastured in the field, is it not evident the fern would be destroyed? The salt alone would destroy the fern; but that the operation may cost nothing it is preferable that the cattle should have the salt, or greater portion, and by their browsing and treading assist to destroy the pest? The last mentioned grows to the height of fifteen or eighteen inches.

Bush hay.—About two weeks past I had many large chestnut trees cut down for the purpose of making hay, but a succession of rains ruined my project. I did not, however, lose my labor, for the trees were worthless, consequently their destruction was proper. In the course of a few days I intend again to try the operation, not on a large scale, neither on the chesnut, as the burs are now sufficiently large to be troublesome; but on a few young poplars and linn, growing on land which is to be cleared. The trees will lie as felled without further interruption, until the leaves appear sufficiently cured for keeping, when the twigs will be broken off by hand, and cast into small piles, to be further cured by an additional day's sun, when they will be secured in the manner of other hay. The leaves will no doubt be better hay than that of common swamp grass, and the twigs will be food, medicine, and manure. As to the quantity of such hay which may be gathered, I can, without experience only, have my opinion, and that opinion is this, that where the materials are abundant, hay can in abundance be made, at a cheap rate. In conversation with a neighbor a few days past, I was informed that he had, when a boy, seen the chestnut hay made and fed to cows, which kept them fat through the winter. When a chestnut tree is cut down, the stump never fails to bear a great profusion of sprouts, which if taken off annually and cured, would be excellent hay.

Cheat.—That wheat may become cheat, I have but very little doubt; that cheat does bear seeds and produce its kind I have no doubt; and that cheat will finally become a dwarf grass, I have but little doubt. I once saw a field of new land which had been sowed in wheat, and close grazed by horses, yield nothing but cheat. I have often cut cheat for hay, and have seen millions of the seeds vegetate and produce their kind. I have sometimes picked the large cheat and other smaller kinds, down to the common greensward, and after arranging them as 1, 2, 3, &c. would challenge any ordinary observer to distinguish between any two contiguous numbers. This year I had a clover lot completely smothered by the cheat, the seed of which was on the ground last year, which wishing to destroy I cut the cheat when yet in bloom, but I was cheated, for the seeds are now vegetating. When cut early, cheat makes a good hay, and next year I intend to cut so soon as the first bloom appears.

Ploughing.—The lower the horse or ox, the nearer is the draft to the line of direction, consequently the less power required; the taller the horse or ox, the longer the lever, consequently the less necessity for the draft being in the line of direction; but is it not evident that if either a low or high horse or ox be ploughed with, at a greater distance from the plough than is customary, (thereby bringing the draft nearer to the line of direction,) there would be advantage. I take no time to make calculations, but it seems to me, that according to the elevation of the shoulder above the plough so the power; if the shoulder could be rought to a level with the plough, or directly in he line of direction, then no power would be lost; elevated to 45 degrees, then half power is lost; to 90 degrees then there is no power.

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* Not so. The specimens of the "rotten limestone" of Alabama, forming the general substratum of the prairie lands, which we have analyzed, contained quantities of pure calcareous earth (carbonate of lime) varying from 72 to 80 per cent., and other earths forming the greater part of the remaining 20 to 28 per cent. See 'Essay on Calcareous Manures,' 2nd Ed. p. 22.—Ed. F. R.

Elder.—Elder is considered a great pest, but it s a good food for sheep, and so long as they stay amongst it they are secure from flies.

Improvement by oats.—I have this year turned under fallow about 25 acres of oats, a portion of which was treated in the same method last year; the yield of which last mentioned was about thrice as much as last year, and twice as much as that adjoining. The second crop is now growing finely, and if they can shortly have the benefit of two or three showers of rain I may make hay of some of the best.

Red [*or earth*] *worms.*—Nature orders all things right; hence stiff grounds are made the natural abode of the red worm. Immediately after a shower of rain, every worm bores one or more holes through the soil, and frequently comes on the surface, by which means the superabundant water is absorbed. As the water subsides the worms again enter the earth, and the air following, the grass or other crop is doubly invigorated. Man generally orders matters wrong; for instead of manuring his clay for the purpose of breeding those worms, he suffers his hogs to run thereon when the ground is wet, by the rooting of which, and destruction of worms, the ground is doubly damaged. As to the grub worm, they are the offspring of slovenly farming; and a sloven deserves all the damage they will do him.

Chinese tree corn.—From what I see and hear of this corn, the American tree corn is far preferable. The Baden corn seems to be preferable to the tree corn. The Chinese corn is nevertheless valuable when sown broadcast and cut as green fodder. MOUNTAINEER.

August, 1839.

WHEAT ON CLOVER, AND LIMING, IN NORFOLK COUNTY.

To the Editor of the Farmers' Register.

Norfolk county, July 23rd, 1839.

I am now getting out my little crop of wheat, and have already cleaned out 118 bushels, and feel confident of 30 to 40 more, which, by the way, is a great crop for this section of country, especially, from about seven acres of land. Last year I produced from a small piece of land not exceeding four and a half acres, sown with five and a half bushels of seed exactly, ninety-two and a half bushels of good clean wheat. In sheer justice, however, to you and your works, I must say that the most credit (if there be any) is due to you and them, especially to your work on calcareous manures. After reading and studying that and some of your first numbers of the Register, I was satisfied that by lime I could make clover, with a little farm pen manure in addition; and from information derived from various sources, I learned that the practice of the best wheat farmers in this country and Europe, was to sow wheat on a clover lay; I have pursued it so far on a small scale, with complete success. For I am confident from some few previous trials, without the aid of lime and clover, the two crops I have mentioned would not have turned out more than one-third or one-fourth as much as they have now done, all other things being equal. So much for my *little* wheat crops, which I have not detailed inminutiæ. Our prospect of a good corn crop thus far is promising. In conclusion I do conscientiously and firmly believe that the easiest, cheapest and best manner or method of improving our lands, is by the aid of calcareous manures, when done judiciously.

R. W. SILVESTER.

PROFITS OF FARMING.

From the New England Farmer.

Much discussion and conversation have been had upon this subject. We do not mean to enter fully or much at large upon a subject which requires to be examined in various aspects and relations, in order that an enlightened and well-founded judgment may be made up; and especially in order that we may not lead to any false inferences of its unprofitableness, nor encourage any fallacious expectations as to any advantages, (we mean pecuniary advantages,) to be derived from it. The erroneous opinions and calculations which have been formed in this matter, have led to most painful results, to serious losses, and to bitter and vexatious disappointments. We know a gentleman who tried farming on an extensive and experimental scale, whose authority is often quoted as asserting that "in agriculture two and two do not make four." We understand it to be implied in this calculation respecting the profitable results of agriculture, or a fair return for the expenditure of labor and the investment of capital, are not likely to be verified as in the other business pursuits of life. We do not admit the axiom in any fair sense. We do not believe that it does justice to agriculture; and no small experience and some observation satisfy us, that circumstances being equal, farming would furnish as fair a compensation for labor, and as as ample a dividend upon the capital invested, as the common trades which men engage in, and and even the pursuits of mercantile and commercial life. Of course we except all extraordinary cases of good fortune, and all matters of gambling and speculation.

The returns of most crops strike one sometimes with astonishment; and would, if taken as a test, lead to the most delusive expectations. A grain of seed sometimes returns one hundred fold; and this being sown a second year, would perhaps give ten thousand fold, and so on in a geometrical ratio. Twenty bushels of potatoes planted will frequently yield four hundred bushels, that is twenty for one. A bushel of wheat sown oftentimes returns thirty bushels. A peck of Indian corn planted will often produce sixty bushels, that is two hundred and forty for one. A pound of carrot seed or of ruta baga, which costs a dollar, will produce six or nine hundred bushels of roots worth one hundred dollars. The proceeds in this case seem enormous, and yet they are constantly realized, and often, it must be admitted, at a comparatively small expense. But no confident conclusions on the profits of farming are to be drawn from such results as these. So many circumstances of abatement enter into the case, that if these are the only elements given in the case, the solution of the problem would give the most egregiously erroneous and deceptive results.

We are not to look to agriculture for any extraordinary or sudden gains, as for example, like drawing the capital prize in a lottery where there are two blanks to a prize; like some successful East India voyage, where the sale of the cargo yields a net profit of one hundred per cent; or like some sudden rise in the stocks, or some monopolized article of produce, where a shrewd operation draws its thousands, or twenties of thousands, into our pockets. But that skill, experience, assiduity, and industry will, in agriculture, yield a fair, and to a reasonable mind an ample compensation, there are too many and reiterated proofs to admit even of a doubt.

As we said in the beginning, we do not design at this time to go largely into this subject, and we refer to it in particular at this time, for the sake of relating some parts of a conversation which we once had with a respectable and independent but complaining farmer in our own despised state.

This man then had a farm which was fully valued at four thousand dollars. The father, who had given the farm to the son, had begun life without a dollar, had run into debt for a large part of the purchase money, but had sometime since, while he supported his family, earned from the proceeds of the farm, sufficient to pay for it. Without any incumbrance he had then put it into his son's possession, and now lived with him under the same roof.

Said the son, Farming is a miserable business!

But why so? Let us look into this matter. What is the estimated value of your farm?

Four thousand dollars.

Is it increasing in value?

Yes; by its favorable location, and by every improvement that is made upon it.

Do you get all the produce from it which it can be made to yield?

No, not one-third. It consists of one hundred and twenty acres. At least fifty acres of it are in wood, and a considerable portion in pasture. Besides that, I have several acres of peat bog, which might be redeemed and brought into English grasses.

What is the value of the wood land?

We supply our family with fuel, and besides this the growth of the wood and the hoop poles which we obtain from it, pays a large interest upon the current value of the land, so that we consider this as one of the most profitable parts of the farm.

Have you done any thing to improve your pasture lands?

No—I suppose I ought to. I tried one hundred weight of plaster spread upon a part of it, and the effects were visible as far as the land could be seen; but then after that, plaster rose *half a dollar* on a ton, and I thought I would not get any more. Then the huckleberry bushes and the sweet fern, and the rushes and alders have come in so that I cannot keep so much stock as I could formerly.

Have you attempted any improvement upon your bog meadows?

No—sometimes I have thought I would. My neighbor J. B. has redeemed eight or ten acres, and now gets two tons and a half of hay to the acre, herds grass and clover and red-top of the best quality, where formerly he got scarcely any thing; but then it cost him at least twenty or twenty-five dollars an acre to drain and manure it; and he will have to top-dress it at least once in five years, or it will never hold out. Then too, he has put on at least half a bushel or more of grass seed to the acre; and grass seed which I used to buy for twelve cents a pound, or two dollars and a half per bushel, is now twenty cents a pound, and herds grass three dollars per bushel. Then too, labor is so high, I cannot afford to hire.

Have you plenty of manure?

No; that is a great want. I have a bog hole where I suppose I could get two hundred loads a year, but then I should have to go *more* than a mile for it, and it is wet work. I have not any of the advantages which the farmers who live within six or seven miles of Boston, and can go in and buy a load of good dung whenever they want.

Do you know what these farmers have to pay for manure in Boston?

Why, yes! I have been told they have to give sometimes three to five dollars a cord at the stables. Sometimes our tavern keeper sells a few loads, but he asks five dollars a cord.

Have you a barn cellar?

No. I have often thought it would be a very good thing, and my barn is well situated for one; but then it would cost, besides what work I should do with my own team, full fifty dollars to make one.

Do you keep cows?

Yes, I keep some just to eat up our coarse fodder; but our women folks do not like dairy work, so we buy our butter and sell our milk to the milk-man for eleven cents a gallon.

Do you keep swine.

Only one or two for our own pork. We do not have any skim-milk or butter-milk for them. Besides there is no great profit in fatting hogs. They will not much more than pay for what feed they will eat. I know they will make a large quantity of manure, but then you must cart in a great deal of stuff into their pens or else they can't make any. But come! I must show you a sow I have got: she is only fifteen months old, and I sold her pigs for more than forty dollars. I suppose I shall make her weigh four hundred in the fall.

Do you raise your own grain and potatoes?

Not all. I raise about three acres of corn and about as much rye, and about six hundred bushels of potatoes. We sell hay and buy Genesee flour. We have tried wheat, but sometimes it is blasted; and it don't make white flour; and our women folks say that they cannot make handsome pie-crust or white bread with it.

How many have you in your family?

I have a wife and eight children, and my father lives with me.

Have you any trade?

No; I have nothing but my farm.

Does your farm support your family and pay your labor?

Why, yes! I have nothing else, excepting a little interest that comes from some money which I received for the sale of wood from the farm, sometime ago, which came to about five hundred dollars, and which I put out at interest. We sell enough produce from the farm to pay our hired labor, which costs about a hundred dollars per year, and our store bills and taxes.

We have very much abridged this conversation, and we shall leave it without farther comment. But here is a husbandman on a farm valued at four thousand dollars, not producing more than one-third of what it might be made to produce, yet supporting a family of eleven persons and paying all expenses, excepting the labor and superintendence of one man, and the farm gradually increasing in value by every expenditure, however small, for its improvement; this man too, not working half the time, and he and his family living in the enjoyment of all the luxuries, if they choose to have them, which they can reasonably ask. Let such a man if he will, take his two hundred and forty dollars income and labor no more hours than he does in the country, and go into Boston and try to support his family there. The end of the year would show him a result which would make him ashamed to complain of his present condition. His whole money income of two hundred and forty dollars would scarcely pay for his fuel, his taxes, and the rent of a ten-footer. What an evil it is that our farmers do not know their blessings!

H. C.

URATE AND POUDRETTE.

From the Long Island Star.

On Thursday last the Mayor and Aldermen of New-York were invited with other gentlemen, to visit the unfinished works now erecting for a Urate and Poudrette establishment. They are situated at Lodi, New Jersey, on the flats of the Hackensack river, near the line of the Newark Rail-Road, on lands of Anthony Dey, Esq. Mr. Barthelemy, who first introduced from France this mode of preparing manure, was of the party, and together with Mr. Dey, ready to give all necessary information of the plans of the company.

The main building, situated at a good landing, and distant from any other house, is 150 feet in length, and is made water-tight, for the reception of 15,000 bushels of the material in its original state. Here it receives a mixture intended to render it in a great measure inodorous, and prepare it for the drying process. There are large drying platforms to be covered with moveable roofs, like salt works, where the material will be exposed to the sun, after draining off the liquid parts, which forms what is called *urate*. Above the main cistern are lofts for the stowage of the article in its finished and unfinished state. On the wharf are two lines of rail way inclining towards the buildings and connected therewith, to convey all articles from the deck of the steam-boat to the buildings.

We were shown on board the steamboat several tubs of which a great number are in course of manufacture. They hold three bushels each, with close and tight covers secured by an iron clasp. It is intended, if the city authorities of New York and Brooklyn shall lend their aid, to change essentially the mode of operations of the night scavengers whose very *necessary* duties are always inconvenient and offensive to the citizens. The tight tubs are to be used instead of being emptied *into the docks* as heretofore; they will be put on the deck of a steamboat, or other boats, stationed in different parts of the city, to be towed away in the morning to this great establishment at Lodi. The company are making all their preparations on a large scale and appear to have the means and the disposition to drive the business effectually.

It is difficult to conceive of any improvement combining more directly the interest and convenience of the city and country. The docks have been made offensive and unhealthy, and must often be cleared out by mud machines—the fish in the cars rendered objectionable, and thousands who live on shipboard, offended by the state of the docks. If all these evils can be remedied, and the great nuisance of the cities be *required* and *demanded* by the country, it will form a combination of benefits most devoutly to be wished." One great objection to city residences will be in a measure removed, and it will probably lead to improvements in dwellings and yards.

We have heretofore published much evidence from practical agriculturists, of the good effect of the manufactured articles. That they are portable in bags and barrels without being offensive, is also well known. There are two companies now in operation in New York, who are at variance in interest, and whose advertisements may be seen in our columns. The public are not interested in their differences, and if competition should grow out of it, probably the great community would be all the better served, and at cheaper rates. It cannot be doubted that the Common Council of New York and Brooklyn, will give every possible aid and encouragement to this most interesting branch of "*internal improvement.*"

ON THE PROPAGATION AND CULTIVATION OF THE QUINCE TREE.

From the Magazine of Horticulture.

The quince is a very beautiful tree when in flower, and when the fruit is ripe in autumn, highly ornamental. It derives its name from *Cydon*, a town of Crete, famous for this fruit; whence its generic name Cydonia.

The trees are easily raised by layers, or by cuttings, taken from the tree in April. Select a shady place in order to plant them in rows, at about a foot apart from each other, and about four inches from plant to plant in the rows; spread over the surface of the ground rotten leaves, or manure, when the planting is finished, which will keep the ground from sudden drought; also, water occasionally, if there should be a continuance of dry weather.

The year following, those that are well rooted may be planted out in May, and those that are not should remain another year. They may also be propagated by budding or grafting: and these trees will bear fruit sooner, and are generally thought to be more prolific, than those raised by any other method.

The best sort for planting is the *Portugal*, being highly prized for baking or stewing. It is of a fine purple color when dressed, and is much better for marmalade than any of the other varieties. The oblong or pear quince, and the apple quince, are also cultivated for family use; but the Portugal sort is in the greatest repute, either for cooking or preserving.

The quince tree may be pruned much in the same way as you would prune an apple tree, taking care to cut out all the old diseased and dead wood, and the cross branches in the middle of the tree, which injure each other by friction. Old trees are very apt to have rough bark; when this is the case, it should be shaved off with a draw knife, and the stems washed over with soap-suds and tobacco water. The trees will thrive in almost any kind of soil; but grow the best in a deep loamy soil, with rather a moist bottom.

The quince tree also makes excellent stocks, on which to graft pears, in order to obtain dwarf trees; for this purpose they may be propagated by cuttings put in as before recommended. The trees may be budded the second or third year, according to the growth they have made.

This fruit is but little cultivated, and, in consequence, always commands a high price in our market: it is as easily grown as any other fruit, and does well in situations where other kinds of fruit trees will not thrive. A little more attention to their cultivation, and a very handsome profit could be realized from a limited piece of ground.

Yours, J. W. RUSSEL.
Mount Auburn, Cambridge, July, 1839.

SPECIFICATON OF A PATENT FOR MANUFACTURING SUGAR FROM BEETS.

Granted to Joseph Hurd, Jr., of the city of Boston, July 26th, 1838.

To all whom it may concern: Be it known, that I, Joseph Hurd, jr., of Boston, in the state of Massachusetts, have invented an improved mode of manufacturing sugar from beets, by which the process is so much facilitated as to enable every cultivator to perform it in his own family, with great economy and efficiency; the apparatus employed not being costly in the first instance, and the operation being carried on, principally, by means of such utensils as every farmer already possesses.

The beets, after being taken from the ground, and freed from all extraneous matter, are to be cut into slices, the thickness of which should not much exceed the eigth of an inch. I have invented a machine for the purpose of performing this operation, which is more effective than any other with which I am acquainted, and for which I have obtained letters patent of the United States. The beets are to be taken out of the ground as soon as they are perfectly matured, and are to be then stored in a cellar, or other suitable place, as otherwise they rapidly undergo a change unfavorable to the production of sugar; they are to remain in this situation until the arrival of the time for slicing and drying them. The proper period for this operation is the earliest season of frost; as, in my process, they are to be exposed to a freezing temperature, so as to freeze, and dry them in the air immediately after they are cut. This freezing is an essential point in my process; this, together with the dispensing with the use of lime, and the producing of sugar without molasses, may be denominated its characteristic features. To dry the beets after slicing them, they may be spread out upon laths, or upon netting, or in any other manner in which they will be most completely exposed to the frost, and to the wind; the desiccation, when sliced as above directed, requires but a short space of time, and is effected without injury to the saccharine principle. After being thus frozen and dried, the subsequent steps of the process may be performed at any time, as not the slightest injury will result from keeping the beets in a dry state for any length of time.

When it is desired to proceed to obtain the sugar from the beets immediately, they may be subjected to the freezing process only, then thawed, and submitted to pressure; they will then readily yield the greater part of their juice, which they would not have done if pressed prior to their being frozen. The pressed slices, with the residuum of the sugar contained in them, may afterwards be dried, and kept as food for cattle.

When the sugar is to be extracted from the dried beets, which may be done at any season, they are to be steeped in pure water, which will take up all the soluble matter, an effect consequent upon the change produced in the beet by freezing. The quantity of water need only be such as shall suffice to cover the beets, and may be about one-half of that which was lost in the process of drying. The soluble materials consist principally of the sugar, the mucilage, and a portion of coloring matter. To free the sugar from the mucilage and coloring matter, I generally acidulate the water before pouring it upon the dried beets, by adding to it a minute portion of sulphuric acid; the quantity of this cannot be easily designated, otherwise than by observing that it shall be no greater than shall suffice to render the acid taste just perceptible. Sometimes I add the water alone, and after allowing a sufficient length of time for it to take up all the soluble matter, which may be from three to four hours when cold water is used, but a much shorter period will suffice with hot water, I drain off, and press out the solution from the residual matter, and then add thereto the sulphuric acid, as before directed. In the former mode but little of the mucilage and coloring matter is taken into solution; in the latter, they are precipitated, or so far disengaged from their combination with the sugar, that they separate in the form of scum, and are readily removed when the liquid is boiled.

The liquid thus prepared, is to be put into a boiler, and placed over a fire, a portion of the white of eggs, or other fining, being added. When brought to a boiling heat, a scum will rise, which is to be removed after damping, or taking the kettle from, the fire, which is to be repeated as long as any scum rises.

The next operation is to filter the liquor through animal charcoal, (ivory or bone black.) A stratum of two or three inches in thickness will suffice for every useful purpose, when the previous preparation has been used as above directed. The sirop will come through perfectly fine, and nearly as colorless as water; there will, however, be a very slight yellowish green tinge, resulting, apparently, from the presence of a peculiar principle in the beet; this material separates when crystallization takes place; although its quantity is minute, and its weight scarcely appreciable, it will, if left among the crystals, occasion an adhesion of the particles, and a tendency to deliquescence; it should therefore be got rid of, and this is easily effected. All that is necessary is to pour a quantity of white sirop upon the crystallized sugar after it has been pressed, so as to moisten it throughout, and then press it again. This operation requires but little time, and should be repeated until the sugar is fit to pack.

The evaporating of the water from the sugar, preparatory to its crystallization, may be in great part performed over an open fire without danger of injury ; it may be completed by placing the evaporating pan in a vessel of water kept at about 50° of Fahrenheit's thermometer. When this s performed early in the season, or by taking beets which have been frozen and dried at the proper time, there will not be the smallest portion of molasses produced, the whole of the sugar being crystallizable. In very cold weather, a large part of the water may be removed in the form of ce, by allowing it to freeze, and much labor and uel be thus saved.

When the clarified sirop is sufficiently concenrated, small brilliant crystals will appear upon the ides and bottom of the vessel, and a crust soon orms over the surface of the liquor; the crystals go on increasing in size, and that portion of the irop from which the air is excluded continues in a perfectly clear and liquid state; but if the sirop be at this time stirred, it becomes opaque, and of milky whiteness; a deposition of fine white sugar hen takes place, and whatever of impurity may have remained in the liquor will rise to the surface; his portion crystallizes more slowly than the other, but by drawing it off, and again exposing it to heat, t will readily form good sugar.

Having thus fully described the process which I have devised for the manufacturing of beet sugar, I do hereby declare, that what I claim as my invention, and desire to secure by letters patent, is the preparing of the beets for the subsequent steps of the process, by exposing them, in thin slices, to the action of frost, after which they may be directly thawed, and submitted to pressure; or they may be dried by a current of cold air, and treated in the manner set forth, at any convenient time; t being always observed that when the process for the extraction of the sugar is commenced, it must be completed without delay, as upon this depends the ability to produce the sugar without moasses, and without the employment of lime to correct acidity. JOSEPH HURD, JR.

The foregoing specification promises much for the benefit of sugar-beet culturists, and we earnestly hope that it may perform all that is promised. Nor are our wishes for the success of this new industry made the less earnest, because it will be best prosecuted under the climate of the northern states, and may not be profitable in the south; or because one strong ground for urging the culture, by some, is not so much to benefit the northern agricultural interest, as to injure that of the south. However, we welcome all real improvements, without regard to the motives for introducing them, or to what portion of our great territory may receive the benefit.

But however beneficial the mode described above may be, we cannot understand upon what ground can be claimed for it the privilege of being secured by a patent right, which would not equally apply to any other improved and profitable process in agriculture or domestic economy. It seems to us that at least as good ground of claims for patent rights might have been presented by Gideon B. Smith (for example) for the use of his discovery that multicaulis trees could be propagated by small cuttings—by Mr. Herbemont, for making wine by adding sugar instead of spirit—and by hundreds of other discoverers of valuable agricultural improvements. According to this view, the editor has lost the chance of gaining some hundreds of thousands of dollars by failing to secure a patent right for directing and *permitting* the manuring with shell marl; and also the chance of thereby giving a ten-fold greater impulse to the improvement of the soil, inasmuch as most persons will eagerly *buy* instruction, which they will not accept or profit by, when offered to them, and urged upon them, *gratuitously*. Therefore, (and waiving all claim to profit individually by the new application of the principle,) it is important to agricultural and general interests that it should be known what agricultural improvements may and what may not be secured by patent right privileges, and which may thereby be made commodities for market, and the subjects of profitable sale. If acted upon universally, the mode would be at least fair for all individuals concerned; and better for them and the public, if bought knowledge and improvements continue to be sought and prized far above what is given without expectation or desire of remuneration. Then, in addition to buying the right of using improved machines and implements to execute certain processes, we shall sell and buy the right to execute the processes themselves, whether they be for such humble objects as the more economically feeding silk-worms, preserving potatoes or pumpkins, or harvesting corn, or for such important improvements as may change the face and double the products of agriculture, through extensive regions. Then, too, agricultural journals will change their character, and become far more profitable to their publishers. For instead of publishing articles of instruction, obtained at the publishers' cost, and which few persons now care to read and profit by, they will be filled with paid advertisements and indirect puffs of the same purport and object, but the printing of which will be a source of immediate and direct profit to the publisher, instead of being at his cost.

SWINE IN A FRUIT ORCHARD.

From the Genesee Farmer.

Mr. Phillips, in a letter published in the Memoirs of the Pennsylvania Agricultural Society, thus speaks of the beneficial results of allowing swine to run among fruit trees:

"For several years past my family have been supplied with the finest plums by a neighbor, who is the only person I know of who has had uniform success with them. Last year while his trees were in full bearing I carefully examined them particularly as respected their culture and local situation, and I found that no uncommon pains had been taken with them, on the contrary they appeared neglected, as numerous dead and broken limbs hung about them; and that the very great success he had, could only be attributed to their situation which was at the place where the hogs lay and were fed. He told me that the hogs never let a plum remain, that had fallen, many minutes undevoured, and thereby destroyed the insects that hung about, and the larvæ in them, and that of late very few insects had appeared about the trees."

We can bear testimony to the efficacy of swine in fruit orchards, in destroying the curculio, or the insect that so much injures the plum and the cherry. We have two cherry trees standing where pigs lie, and are fed, and though not as favorably situated as many others on our premises, in other respects, they uniformly produce the finest cherries grown on our trees. After the cherries begin to ripen, there are few hours in a day in which the trees are not visited by the pigs, and every worm, stone, and cherry, are at once disposed of. On our other trees, the curculio, does much mischief annually, on these the fruit is nearly exempt, and is decidedly larger and fairer than on those to which the swine have no access. In planting plum or cherry orchards, this fact should not be forgotten; and pigs should have the free range of such premises.

INTRODUCTION OF THE MORUS MULTICAULIS LONG BEFORE ITS DISCOVERY BY PERROTTET.

There have recently been published several communications of the remarkable, and to most persons the incredible fact, that the morus multicaulis has been growing in Craven county, North Carolina, unnoticed and unknown, for about half a century; or for some thirty years earlier than the importation of the tree from the Phillippine Islands to France, by the botanist Perrottet—which, until this late contradiction, had been admitted generally (and in this country universally,) as the earliest introduction of the plant from Asia. The most full account of the North Carolina growth is given in a communication to the last number of the 'Journal of the Silk Society,' by George Wilson of Newbern. Mr. Wilson describes the plant from actual inspection, as it appears, and vouches for its identity with the morus multicaulis; and he states, from the information of others, the account of the origin, which we will here condense. He reports that a Frenchman, named Fonville, emigrated about fifty or sixty years ago, and settled in Craven county. He brought with him mulberry plants and silk-worms' eggs, for the purpose of prosecuting silk-culture, but which was prevented by his death occurring not long after. The mulberry trees, which he planted, being no longer valued or protected, and being in cultivated land, have been gradually disappearing, from being cut and grubbed, and burnt over, until but one root remained, which was lately rescued and removed by Daniel Lewis. "Until within the last twelve months" adds Mr. Wilson, "we never heard of the multicaulis here, but one individual, who had bought six of them, about three years since, of Prince of Long Island, and has nursed them up to 1500. A speculator came along, and bought them up at 35 cents, and spread among us the importance and the name of the tree. Then it was that Lewis said that he knew where some of the same trees grew, and he went, in company with a man named Gooding, and procured those of which I have already informed you."

It is not our object at present, either to affirm or deny the correctness of this recent statement. It is more than probable that there has existed some source of mistake, unknown both to the writer of the communication and to those from whom he derived his information. But whether that supposition be true or not, we can make manifest the *possibility* of the morus multicaulis having been brought from France fifty years ago, from indubitable evidence in our possession of the fact that the tree was growing in France some years still earlier; and that, though preserved and propagated by a few curious cultivators, merely as a rare plant, it remained unnoticed by all other persons, and scarcely known, until in 1834, the date of the report on the subject which we shall give below. *If it should be proved* that the growth referred to has really been so long in North Carolina, and is the true morus multicaulis, (neither of which is yet *established,*) than this publication will serve to clear up the otherwise mysterious and incomprehensible fact of the early introduction. The report below is a translation from the original which is in our possession, and may be found at page 350 of the '*Annales de l'Agriculture Francaise,*' for 1834.

"*Report of M. Jaume Saint-Hilaire to the Royal and Central Society of Agriculture.*

Sitting of June 18, 1834.

In a journal of Lyons, which M. Huzard, the father, has communicated to the society, M. Henon, Director of the Royal Nursery of that city, announces that the morus multicaulis has been cultivated for many years in Vaise, near Lyons, in the nursery of M. Nerard, nursery gardener. His father had received it from Rast de Maupas, before 1809, since which time he had lost, by a severe winter, part of those he had. Not having deemed the multicaulis preferable to the ordinary white mulberry for feeding silk-worms, he cultivated it merely as an ornamental tree, suitable to display in masses, and in English thickets.

M. Seringe, professor of botany at Lyons, adds, in support of this annunciation, a manuscript note of Madiot, who for a long time was the director of the royal nurseries. This note is in these words:

'The mulberry tree which is said to have been brought from the Philippines by M. Perrottet, is a tree of the second degree of size, which I met with in 1800 in the nursery of M. Nerard the younger, at Vaise. This same variety has yielded fruit for more than fifteen years at the Acclimating Nursery of the Rhone."

M. Henon declares that he had seen at Ecully, in the garden of Rast de Maupas, the mulberry tree from which had been propagated those of Nerard. This tree, as well as many foreign oaks and walnuts, has been cut down since the death of the proprietor.

The statement in the Lyons journal was supposed to have been founded on a mistake of the species, and that the trees reported to be the multicaulis were some of the varieties of either the white or black mulberry, or the Italian. The Society [*Royale et Centrale d'Agriculture,*] having charged me to examine and report on this subject, I have assured myself of the identity of the species cultivated at Lyons with that of the *Jardin du Roi* of Paris, brought by M. Perrottet. I have asked for and obtained specimens, and have now the honor of exhibiting them to the society. They are as follows:

No. 1, is the morus multicaulis of the school of the *Jardin du Roi*, imported by M. Perrottet;
No. 2, that of the mulberry of Lyons;
No. 3, that cultivated at M. Nerard's at Vaise;
No. 4, that of M. Seringe;
No. 5, that of Messrs. Audibert of Thonville.

It would be difficult to find distinct characters among all these mulberry trees, or believe them to be other than the same species. If the season had been suitable, I would have been able, to complete the conviction, to produce the flowers and fruits; but I believe that this additional proof is not necessary, and that we may rest upon the testimony of the able botanists and zealous cultivators, Messrs. Seringe, Madiot, and Henon.

Nos. 6, 7, 8, 9, 10 and 11, are samples of other mulberry trees cultivated in France, and in the *Jardin du Roi*. They all differ from the morus multicaulis.

Knowing that Poivre, the able and upright administrator of our possessions in India, had made many voyages to China and to Cochin-China, and that he had constantly been occupied with the culture and naturalization of useful vegetables, I had supposed that it was he who had first introduced the morus multicaulis in the neighborhood of Lyons; and I was confirmed in that opinion, when I afterwards learned that Rast de Maupas, who cultivated this tree at Ecully, and who gave it to Nerard the father, had been the physician and intimate friend of Poivre. Favorable circumstances perhaps will furnish me with positive proof of this; and that if M. Perrottet has introduced this tree into France about fourteen years since, that Poivre also had brought it forty or fifty years earlier. He was long the governor of the Isle of France, where he bought of the Indian Company a piece of ground called Montplaisir, of which he made a magnificent garden, in which he brought together the useful plants of the two hemispheres. This garden, long after, as a traveller has stated, was considered one of the wonders of the world. A philanthropist as well as a ruler, Poivre did not neglect plants which had no other merit than their novelty; but he principally fixed his attention and lavished his cares upon the plants of known utility. When afterwards retired at Freta, near Lyons, he founded there a collection, drawn from the four quarters of the world.

It is unfortunate that after the death of Poivre, his garden did not find in his successor a zealous cultivator, to preserve and especially to spread abroad the plants which Poivre had collected. The person who propagates a useful plant, makes its value known, renders it popular and brings it into general use, merits as much the gratitude of the society, as he who may have merely introduced it from its remote native region. Thus the potato had been known in Europe and in France for two centuries, without any benefit to the people; whilst that in the last forty to fifty years, that by the zeal of Parmentier, and since by our fellow members Sagaret and Vilmorin, this vegetable has been disseminated and cultivated in almost every part of France, introduced into every household, and even upon the tables of the rich, France has not suffered the terrible scourge of famine which, twice or thrice in each century, had before afflicted the nation. JAUME SAINT-HILAIRE.

It can scarcely be supposed that a committee chosen by the most distinguished agricultural society in France, and the society also, with the specimens before them, could be mistaken as to the identity of the several trees with the morus multicaulis; and the publication of the report, without objection or contradiction then, or subsequently, from any quarter, is sufficient confirmation of the judgment of the committee. But though the fact is well worthy of notice, as a matter of curiosity, it serves not in the slightest degree to diminish the merit of Perrottet, the subsequent (and as he himself, thought the earliest) discoverer and introducer of the morus multicaulis into Europe. And neither would the fact (if true) of Fonville's having brought one of the then new plants to North Carolina, among his other species of mulberry, and its progeny having lingered through half a century of neglect, and ignorance of its kind and value, detract in the least from the credit due to those who have made the value known, and thus caused the extensive propagation of the tree in Europe, and still more in this country. It was our having taken this view of the subject which prevented the bringing before the public at an earlier time the report of M. Saint-Hilaire. For though we went zealously and fully into the controversy as to the introduction of the morus multicaulis into this country, it was to transfer the award of merit from where it had been misplaced, to where it was justly due; and to decide the question as to who had disseminated this plant and extended its culture with a knowledge of its value, and not merely as to who might have been the first importer *by chance*, or one of the earliest possesors, also by chance, and in ignorance of its value, or without showing any zeal, or making any effort, to extend the culture, except as, and when afterwards it became, an article of very profitable sale and speculation. In our appeal on this subject (p. 497, vol. vi,) designed to show that the great merit of public service in this respect, was justly due to Gideon B. Smith, and not in the slightest degree where assumed, (and in the latter case we affirm that there was no more claim for the first importation from Europe than for the after dissemination,) we should have passed over all consideration of the importation from abroad, as immaterial to the argument, but for the merit of the importation, as well as the after and gratuitous distribution, being assumed by a person having no ground whatever on which to found such broad pretensions. But let the honor due be awarded to *all* who have any *just claim*, either to discovering, or making known the utility of the plant, and spreading its propagation with disinterested and philanthropic views, as well as to those who, though merely as intelligent and curious observers, were induced to select and introduce the plants from remote countries. Among the latter, without abstracting any thing from the credit justly due and heretofore awarded to Perrottet, there is ample room for the intelligent and zealous Poivre, and also for Fonville, should the claims for his importation be established.

ON COTTON LICE, AND THE MEANS OF RESTRAINING THEIR RAVAGES.

To the Editor of the Farmers' Register.

Greene county, Ala., July 16, 1839.

I see you state in the Register that you are of opinion, that limed land will grow the morus multicaulis more luxuriantly than the unlimed. You are correct; on my sluice (called here slue,) and hammock lands, which is very black, and containing about 55 per centum of lime, the native mulberry here abounds, and its leaves are larger by a third than on the unlimed land; and in the spring when they start, they grow with a rapidity unknown to me before.

We have again this spring been visited by the lice in our cotton, though the spring being early, dry and hot, but little injury has been sustained, and at this time our crops are *very* promising. Various opinions are entertained and expressed of this insect, and the method to be pursued to avoid its ravages. To me it is obvious that if they be not the ant, the two at least live in a state of harmony together, and are always seen together. I believe them to be the ant arrived at the medium between the crawling and flying ant, brought up from the earth and deposited on the underside of the cotton leaf, by the crawling ant, the juice of which the suck; they there undergo a kind of moulting, come out winged about the size of a gnat, the wings jutting back like the locust, and they then fly off. To prevent their ravages, various remedies are proposed; the principal opinion in this neighborhood is late planting—but from this, as a general rule, I differ. I believe our cotton land should be bedded in January and February, and ploughed deep with a turning plough; whereby a great many of these insects will be turned out of their winter quarters and destroyed. Second. The planting should be regulated by the spring, if open and warm, and a prospect of continuance, plant early, viz. 25th to 30th of March; but if the spring be wet and cool, or simply cool, wait until this subsides, even if to the 10th or 20th of May, for if the cotton comes up in this kind of weather, it will not grow off, and the ravages of the insect which are peculiarly severe in every cool spell, will destroy the crop before it can grow off. Third. When planting, open the beds with a common shovel plough of ordinary length, sow down the cotton seed in it, and in three days begin to cover the seed by throwing on two furrows with the same kind of plough; as soon as the seed begins to sprout and come up, harrow or *board off*. By this mode of planting, there is more or less destruction of these insects at planting, covering and boarding off, the cotton comes up on a clean bed, and will grow off speedily if the weather be warm.

We who live in the prairies, feel a great want of knowledge in preserving our butter during summer for winter use; for generally we are without milk or butter. Our milk cows usually wean their calves in the fall, and calve again in the spring. Such information in the Register, would no doubt be highly useful. I saw a receipt for salting butter 3 or 4 years ago in the Christian Advocate and Journal, published in New York. The receipt directed rock salt ground, loaf sugar and nitre, but the proportions and quantity used to the butter I have forgotten, the paper being unfortunately destroyed. Will you be so good as to procure it, and insert it in the Register?

T. DE GRAFFENREID.

The particular paper referred to above is not at our command; but it is probable that the receipt contained was no better, and resting on less authority, than any of the different directions for preserving butter which have been published in various parts of the volumes of the Farmers' Register, and which may be readily found by our correspondent. But, if we understand his expressions correctly—that on his rich calcareous soils, (which of course ought to be good grass-growing land,) they are generally without milk and butter through the winter—there must be other deficiencies in dairy management much greater than merely not preserving the summer butter for winter use. The latter is indeed highly important, and especially for sale at remote markets; but with the great advantages offered, in soil and climate, to a cultivator on the Alabama prairies, he ought to be well supplied with both milk and fresh butter through the short winter of that fertile region.

ANTI-SEPTIC EFFECTS OF LIME WATER.

From the Farmers' Cabinet.

The Mechanics' Magazine having just arrived from England. I extract from it the following letter on the preserving of wood by lime water. The Cabinet already contains some information on this subject, but perhaps, it would be well to show that the experience in England agrees with that of our own country. The most likely way, in my opinion, to bring it into general use, would be for some industrious person to take out a patent for it, and sell out state, county, and township, as well as individual rights, to use the process;—say charge each and every farmer five dollars for the privilege of steeping his posts in lime water, and it would soon become universal; some would pay the fee, and others would make a merit of evading the pretended patent right. The old folks would affirm that there was nothing *new* about it, that they knew it before the patentee was born, though they had omitted to try it themselves; and the young ones would shrewdly suspect that it did not differ much in principle from the well known practice of white-washing. Z.

Preserving wood by lime water.

Sir,—I some years ago called the attention of the readers of your instructive periodical to Sir Charles Steward Menteith's, (of Closeburn, Dumfrieshire,) simple *unpatented* method of preserving timber; I think it so valuable a process that it cannot be too often published. It is as follows: after cutting the timber to the size it will be wanted, it is steeped in a pond of lime and water for a fortnight, or more or less time, according to the size of the wood. Sir Charles has now some farm buildings on his estate, the timber of the roofs of which is the common young Scotch fir, but having undergone the *lime-water* process, it is as sound, after a lapse of forty years, as the day it was put up; the same timber, under ordinary circumstances, and in similar situations would rot in from three to seven years. The carpenters find, in working the wood thus treated, that the edges of their plane-irons soon become dull, and on examination, it is found that the acid contained in the wood is crystallized by combining with the alkali of the lime.

Yours faithfully,

ARTHUR TREVELYAN.

Wallingtone Newcastle, Tyne,
7th of May, 1839.

CULTURE OF BROOM CORN IN SALEM, N. J.

From the Farmers' Cabinet.

Your letter of the 20th July was received on the following day, asking information respecting the cultivation of broom corn, and the quantity raised on my land per acre. In answer thereto, I say that my land is a loamy soil, and in good condition, producing generally about sixty bushels of Indian corn per acre—of wheat from twenty to thirty—and of barley from thirty to fifty.

My usual method is to cart out all my manure from the barn-yard through the winter and early in the spring, so that the greater part thereof is upon the fields by the time the plough can be put into the land. The cultivation of the broom corn by Mr. Brown (the paper you say heretofore sent to you being lost, giving an account thereof) and by him attended to until the brooms manufactured by him were sent to market, amounted, according to his estimate furnished me, to $96 50. While in conversation with him, he drew from his pocket a paper containing the following words:—"Was raised on eight acres of land, the property of Robert G. Johnson, broom corn that made four hundred dozen of brooms, that weighed one and a quarter pound each. Many of the stalks measured sixteen feet six inches in length, and produced four hundred and thirty bushels of seed.

ISRAEL E. BROWN."

I would observe that I commonly manure my land at the rate of from thirty to forty loads per acre—such was the dressing the land got previous to the planting of the broom corn. The land being in high tilth, produced, from careful attention, a most luxuriant crop of stalks; I think they must have averaged from fourteen to sixteen feet in height throughout the whole field. I have not been inclined to encourage the rearing of the broom corn more than a sufficiency for family use. I consider the broom corn a much more exhausting crop to the soil than any other grain. There appears to be an oleagineous quality peculiar to it, and somewhat analogous to flax seed, which in my judgment has a tendency to produce the impoverishment of the soil. The seed makes excellent food for hogs and cattle.

Its nutritious quality may easily be discovered from the fine color and taste which it imparts to butter from the cows which are fed on it. The best way to use the grain is to grind it with a portion of oats—say about one-third of oats to two-thirds of the seed. Indeed it is so hard and flinty that it should always be ground before feeding it to any kind of stock.

Good broom corn seed weighs about fifty pounds to the bushel. Its value compared to oats may be considered as about half as much again; so that should the market price of oats be, say twenty-five cents per bushel, the broom corn seed would be worth thirty-seven and a half cents.

Brooms.

I think there is a difference of twenty-five, if not thirty per cent. in the quality of brooms sent to market, from such as I generally use in my family. I always endeavor to procure from the manufacturer, and for which I pay him an extra price, such as are made from the stalks before the seed ripens on them. A broom made from such tops will last much longer than one made from the ripe brush. But the peculiar excellency of the broom consists in its fibres being more soft and elastic, and performing the act of brushing or sweeping, similar to the brush made of bristles, without injuring the carpet if used prudently. After the broom shall have been used in sweeping the parlor, and the finer parts worn away, it will then be as good to sweep the other parts of the house, as the best new broom made from the ripe corn. Ladies who set so deservedly such a high value upon their beautiful Turkey and Brussels carpets, should purchase none other than such as are made from the unripe brush. The broom made from such may be easily known by the color of the straw, which is that of tea or sage; the fibre or straw is much finer and of a softer feel than that of the broom made from the ripe corn—the color of which is red, or inclining to red.

Yours very respectfully,

ROBT. G. JOHNSON.

THE MORUS MULTICAULIS CROP AND PRICES.

Though many of our readers are perhaps weary of this subject, there are many others who would deem it a most culpable omission in our publication, if they were not kept apprised of the general state of the market for this new agricultural product, and important commodity of trade, and subject of speculation. We have not designed to offer frequent or very minute reports. To do that, would require a publication for that purpose alone—and such a one already exists, in 'Morris's Silk Farmer' of Philadelphia, which is a little weekly sheet devoted to this subject, and which every person interested in the sales ought to have. The establishment of such a publication is one of the most striking features of this very remarkable mulberry speculation; and a file of the 'Silk Farmer' will present hereafter a curious and copious record of speculation statistics, and of current opinions on the subject. Our own reports on this subject must necessarily be comparatively very short, and given at distant intervals. We have endeavored not so much to give the strangest facts, or the most recent news of prices, as the general and undoubted condition of the market, and well considered and correct opinions. Of course we must be always in the rear of the latest accounts.

The opinions expressed in our last report on this subject, given two months ago, (at page 381,) have been fully confirmed by the events, so far as known, and to this day. There have been some fluctuations. Prices advanced more rapidly in July than we expected, and early in August, there was something of reaction in Philadelphia, (the great mulberry mart,) and some decline of prices in the case of particular holders who were either very timid, or compelled to raise money. The general pressure in the money market necessarily affected mulberry sales and speculators, as well as in regard to stocks of all kinds, and all subjects of speculation. Still no sacrifices (on previous prices) were made by any except some small cultivators and holders; and we have heard of no sale of any description made at less that a considerable advance on the prices of July 1st; since which time there has been, on the whole, a general and sound increase of the actual prices paid or contracted for. At that time, 50,000 trees, a part of our own planting, (on Coggin's Point farm,) were sold for 25 cents; and crops growing in and near this town, not of better growth, have been sold within the last 10 days at prices ranging from 30 to 40 cents, and to persons who purchased to plant, and a part resold at 50 cents.

We have, at no time, been so sanguine as most other persons in regard to the prices of this year; still, we have attached no importance to the recent depression, with some panic, in the market, and consider that it has already nearly passed away, where it originated, and had been most felt. Through the country generally, it has not been felt at all, and scarcely heard of; though exaggerated rumors in some quarters caused alarm, and, consequently, offers were made to sell at reduced prices. The little effect produced by the decline of demand, and the consequent *panic*, has served to increase our degree of confidence in the demand, and in present prices, at least, being steadily maintained. The real demand, for cultivation, has scarcely yet commenced, and indeed it is too soon to buy any crop months before it is ripe. The speculative demand started too soon, and advanced too fast, and therefore was necessarily checked by a pressure which bore heavily on the whole trade and moneyed transactions of the country. It is perhaps out of place here to discuss a state of the market which is already passing away where it originated. But the first news of it, and that much exaggerated, may yet be slowly reaching our distant readers, and may render this statement of some utility to them. For ourselves, (though we may be as liable to mistake as others,) as at present informed, we would not take less than the average price of 50 cents for our remaining trees, grown from cuttings planted this year—which price, indeed, would be less than half a cent a piece for the buds thereon.

DESTROYING LICE ON CATTLE.

From the Maine Farmer.

Mr. Jabez Besse Jr. of Wayne informs us that he recently tried an experiment for destroying lice on cattle, which was very successful. He took old beef brine, made of salt with a little salt-petre, and put it on the backs of his cattle, and it destroyed both lice and nits. This remedy has no bad effect on the cattle, as tobacco and some other applications for lice have, but on the contrary the cattle like it; it tends to make them peaceable, as they will stand and lick one another with apparent satisfaction.

The remedy is simple, cheap, and easily obtained, and well worth the consideration of those troubled with lousy calves or cattle. R.

DAILY VALUE OF SUNSHINE.

From the Genesee Farmer.

The value of the agricultural products of the United States cannot be less than $500,000,000 annually. The perfection of this is depending on the weather of four months, June, July, August and September, or about 120 days. Every one knows that without sunshine the crops would be a failure, either partially or totally; and hence we can estimate its average daily value at about *four millions of dollars daily*. There can be no doubt that, considering the nature of the previous weather, the beautiful days preceding the 20th of July added from ten to fifteen millions daily to the value of our agricultural products; yet like many other good things, the very commonness of this invaluable and powerful agent, causes it to be overlooked, and its results undervalued. Without sunshine the earth would soon become another chaos, destitute of order, "without form and void."

EXTRACTS FROM THE EDITOR'S PRIVATE CORRESPONDENCE.

Matthews, July 18, 1839.

The season so far, has been very favorable for corn. I think the wheat crop in Virginia will fall very far short of expectation; I have just sent mine to market.

—

Rockbridge, July 19th, 1839.

Our harvest is closed, the fields are literally studded with shocks of grain, being the most abundant crop ever cut in the county; in some sections the wheat is slightly injured by the smut. Corn and clover have suffered from drought, but it is now raining, and which makes the prospect of a corn crop flattering.

—

Albemarle, July 31, 1839.

My lime improvements have completely succeeded, and I have now a very productive farm, where there was before nothing but a dreary gullied waste.

—

Lynchburg, Aug. 17th, 1839.

Crops in this and the contiguous counties are extremely promising. Indian corn is nearly matured, and will be very abundant. The crop of tobacco is uncommonly early, and will, I think, be nearly secured by the twentieth of September. Scarcely any disaster can prevent the quantity from being large; but the season during the next thirty or forty days must determine whether the quality will be good. The crops of wheat and oats, which have been secured, are abundant, and of fine quality. Upon the whole, it promises to be one of the most fruitful years we have had since 1817.

SEASON AND CROPS.

The unusually favorable season has continued, without any exception, save the disadvantage which is so unusual in this month, of there having been too much rain. The excess has not done visible injury to growing crops; and, on the contrary, has added to the general vigor and luxuriance of vegetation. But, though a good crop of corn is now sure, still we do not believe that the produce will equal general expectation. We rest this opinion less on actual observations (which have been very limited,) than our general opinion that a season wetter than necessary, produces stalk and leaf in quantity out of proportion to the grain; and this will be found true as to all grain crops, and at all times.

The ravages of the chinch-bugs, which were expected to be so extensive and destructive to the corn-fields, after the wheat and oats no longer afforded them food, have done comparatively but little general injury. It was not that these insects did not pass, as usual, and in immense numbers, to the corn-fields, but the quantity of rain kept them in check, and also gave such vigorous growth to to the plents, that they were enabled to withstand the draught made by these devourers.

Tobacco is very luxuriant and well advanced. Cotton has almost ceased to be a field crop in this region, and we have no information in regard to it. The earth has been all this month softened enough for ploughing fallow for wheat—which is an advantage rarely enjoyed in lower and middle Virginia.

AGRICULTURAL CONVENTION OF SOUTH CAROLINA.

We rejoice to see that an agricultural convention for the state of South Carolina, is to be held in November next. If zealously and efficiently carried through, there is no initiatory measure more likely to render service to the declining agricultural and general interests of South Carolina; and no state in the confederacy needs such aid more, or is better fitted, by the offered bounties of nature, to profit by the first efforts, and what we hope may be the consequences of the action, of a properly operating agricultural convention. In referring to the means for resuscitating, and giving new and heretofore unknown vigor to the soil of this state, (or at least a large portion of it,) we allude principally, though not exclusively, to her immense and as yet untouched and profitless beds of fossil shells, or marl, which alone would serve, if judiciously and properly availed of, in a few years to increase the gross products four-fold, and the net product ten or twenty-fold, of all the region underlaid with this calcareous deposite. And we firmly believe that this immense amount of improvement, and of created wealth, might be secured, by an outlay of annual expense not greater than the actual cost of removal annually incurred by the thousands of emigrants from South Carolina, who are continually deserting her in her decay, to seek more fertile lands in the new southwestern states. This declaration will probably be deemed ridiculously extravagant. Nevertheless it is our firm belief, founded upon large experiment and very extensive observation of the use of calcareous manures in the similar region of lower Virginia—though applied there as yet very insufficiently, and generally injudiciously, in almost every case. *Where marling begins, emigration ceases.* We are not among the adventurous class of speculators, or of those who are willing to exchange a certain benefit in hand, for the chance of a much greater one in prospect. Yet—if it were possible to try the chance—we would not hesitate to exchange all the possessions that we have yet acquired, and our labor for the next twenty years, for the one-hundredth part of the *net profit* which South Carolina alone would gain by the judicious, economical, and general use of marl, after the mode, and in accordance with the theoretical views, which we have tried so vainly (or at least with such limited influence,) to impress upon the great agricultural public.

MONTHLY COMMERCIAL REPORT.

For the Farmers' Register.

The news lately received from Europe is of a less favorable character than had been expected. The continued demand in England for specie to pay for grain, which it was supposed would have ceased, or been substituted by exports of manufactured goods, continued to render money scarce, and kept up the rate of interest. A long continued spell of wet weather created apprehensions for the grain crops, and until these are allayed, business cannot resume its regular course. Should there be another bad harvest the increased price of grain in this country for export to England, will be by no means equivalent to the reduction in the price of cotton and other commodities.

Although the diminished exportation of cotton from the United States, which, as compared with that of last year, is 500,000 bales, had some slight effect on the prices, they were yet so low as to cause heavy losses to shippers; and the consumption of the first six months of 1839 had been on so small a scale that it is not possible for the increase of the second six months to absorb the stocks on hand on the 1st of August. The growing crop, therefore, which will doubtless be a very large one, must be sold at moderate prices compared with those which the planters have been accustomed to, and retard the payment of the large amount of debt contracted by the great cotton growing states in the south-west. The exports of the last crop have nearly ceased. Compared with those of 1838 they are as follows:

1839, to Great Britain, 785,000, France 230,000, other ports 30,000.
1838, to Great Britain, 1150,000, France 315,000, other ports 83,000.

The crop of the United States received in 1839 is 1,340,000, in 1838, 1,790,000.

Tobacco was also dull in the European markets, and the price was declining. The quantity inspected in Virginia in 1839 is about 27,000 against about 43,000 hhds. to same time in 1838. Prices have consequently declined here and may now be quoted $4.50 to $12, embracing all qualities. The export of the season has nearly ceased. The prospect for the growing crop is favorable, and it bids fair to be one of the largest ever produced.

The price of wheat is $1.10 to 1.20; the quality of that which has yet been brought to market in Virginia is much inferior to that of last year. The effect of the western crop is not yet felt. It is reported to be large and fine, and in the absence of a large export demand, the price must be low. This, however, will depend on the result of the English crop.

Of Indian corn the crop will be most bountiful, and in anticipation of this, the price has declined to about 60 cents per bushel.

Internal exchanges continue in a very deranged state. Stocks of every description are low beyond precedent, and commercial affairs in a gloomy state. X.

August 26.

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WASHINGTON COLLEGE,

IN

LEXINGTON, VIRGINIA.

The next session in this institution will commence on the first day of September, 1839, and continue until the last Thursday in June 1840; a term of ten months.

The Faculty consist of;

Henry Ruffner, D. D., President, and Professor of Ethics and Rhetoric.

George E. Dabney, A. M., Professor of Ancient Languages, and Literature.

Philo Calhoon, A. M., Cincinnati Professor of Mathematics.

George D. Armstrong, A. M., Robinson Professor of Physical Science.

Francis H. Smith, Cincinnati Professor of Military Science.*

*——— ————, Professor of Modern Languages and Literature.

Jacob Fuller, A. B., Superintendent of the Preparatory School.

The regular course of study, which it is necessary that a student shall have completed to obtain the degree of Bachelor of Arts, is as follows.

Classical Department. Tacitus' History, Pliny's Select Epistles, Livy, Cicero De Officiis, De Senectute, De Amicitia, Horace's Odes, Satires and Epistles, Select portions of Juvenal, Terence and Perseus, Xenophon's Cyropædia and Memorabilia, Homer's Iliad, Herodotus, Demosthenes, Sophocles' Œdipus Tyrannus and Euripides' Medea.

Mathematical Department. Algebra, Plane and Solid Geometry, Plane and Spherical Trigonometry, with their applications to the Mensuration of Heights and Distances, Land Surveying, Navigation, Spherical Projections, Dialling, Nautical Astronomy, Trigonometrical Surveying and Levelling, Analytical Geometry and Conic Sections.

Department of Physical Science. Chemistry, Electricity, Magnetism, Heat, Mechanics, Hydrostatics, Pneumatics, Optics, Astronomy, Lectures on Botany, Mineralogy and Geology.

Rhetorical and Ethical Department. Philosophical Grammer, Logic, Rhetoric, History, Mental Philosophy, Moral and Political Philosophy, Constitution of the United States, Law of Nations and Political Economy. Besides the subjects above specified, the Professor in this department is to lecture on Sunday mornings, to all the students, on Natural Theology and the Evidences of *Christianity.*

Besides the above course of study, the board of trustees at a late meeting, determined to establish the following course, intended to meet the peculiar wants of farmers:

Mathematics. Algebra (through quadratic equations) Plane Geometry, Plane Trigonometry, Mensurations of Heights and Distances, and Land Surveying.

Rhetorical and Ethical studies. Philosophical Grammar (with special reference to the English language) Logic, Rhetoric, History and Composition; Mental, Moral, and Political Philosophy, with the Federal Constitution, and Political Economy.

Physical Sciences. General Chemistry, Natural Philosophy, (including Mechanics, Hydrostatics, &c.,) Botany, including Vegetable Physiology, Mineralogy, Geology, and Agricultural Chemistry.

Students who shall have completed this course, and stood a satisfactory examination on all the studies embraced in it, shall be entitled to an official certificate to that effect, with the college *seal annexed.*

Bill of expenses in the College. Treasurer's bill, per annum; tuition 30 dollars, room-rent 4 dollars, deposits 6 dollars. Total 40 dollars.

Board 7½ to 9 dollars per month; washing 10 dollars per session of 10 months, fuel and candles about 12 dollars; bed 6 to 8 dollars. Total per session, about 150 dollars.

The college is situated in one of the most beautiful and healthy parts of Virginia; and no effort will be spared, on the part of the faculty, which may be necessary to enable the student to acquire a complete and thorough education.

Lexington, Va., June 28th 1839.—x2t

---

* In the Virginia Military Institute connected with the College.

NO-BONE

BREED OF HOGS.

For sale, full blood pigs of this breed which is so valuable for readiness to fatten, on clover grazing, or in the stye. Price $5 each. Inquire, (post-paid,) of the editor of the Farmers' *Register.*

May 31,—tf

DURHAM CATTLE.

Not wishing to breed "*in-and-in*" any longer, I offer for sale, (or exchange for another of equal value,) my imported Durham bull. I have also for sale, some of his calves. For particulars, see Mr. Berry's certificate below—also his letter in Vol. V., Farmers' Register, page 383.

Address— **EDWIN G. BOOTH.**
Black's and White's, Nottoway, Va.

CERTIFICATE.

Roan bull calf, sold to Mr. Edwin G. Booth, calved March 12th, 1834; got by Minstrel, (bred by me) out of Peaseblossom (also bred by me) by Mr. Whitaker's Triumph, (1530; Herd Book,) g. dam *Rose,** by Arthur, (761) gr. g. dam, by Mr. Allison's bull, *gr.* gr. g. dam Mr. Hutchinson's of Eggleston's Favorite, and thence from the stocks of Messers. T. Collings and Charge.

---

* Rose won the sweepstakes at Lancaster, in 1616, beating three others; and in 1619, she won the cup. She and her daughter Peaseblossom, were extraordinary milkers. A son of Peaseblossom, as well as herself, and twin heifers of hers, received the medal of the Liverpool Agricultural Society; not being within the limits of the society, they could not be entered for the Premiums.

Minstrel, above named is by Martin, dam Munia, by Weston, (462) g. dam Minerva, by Harold, (291) gr. g. dam Mary, by Meteor, (332) gr. gr. g. dam Magdelana, by Comet. Magdelana gave sixteen quarts of milk twice a day, and Harold was sold at a year old in R. Collings' sale, for £200, and Meteor by private treaty for £250.

Munia is dam of the Rev. H. Berry's cow, whose portrait is given in the history of work-horses, published in the Farmers' Series, by the Society for Promoting Useful Knowledge.

HENRY BERRY.

Liverpool, December 20, 1834.

P. S.—Martin, by Belzoni, (763) out of Rosanne.†

Belzoni, by North Star, (456) dam Cleopatra, sold in R. Collings' sale, a calf, for 133 guineas.

H. B.

---

† Rosanne, by North Star, (459) dam Surprise, by Major, (396) g. dam Red Rose, by Yarboro' (705) gr. g. dam American Cow, (own sister to R. Collings' Red Rose,) by Favorite, gr. gr. g. dam by Punch, 531 Foljambe, 263 Hubback, James M. Owens' Red Bull, 97.

July 27—2t.

CLAIRMOUNT NURSERY,

Near Baltimore.

The subscriber has for sale on pleasing terms a large stock of the **MORUS MULTICAULIS MULBERRY TREES AND CUTTINGS,** which are warranted to be genuine, being raised by him from a stock he has been raising from for seven years. Purchasers may rely on getting a good article, and carefully packed, so as to go safely to any part of the union. The above would be sold much lower deliverable during the autumn.

Also a general assortment of all the most rare and choice grafted fruit trees, especially 20,000 **PEACH TREES** and shrub fruits. Ornamental trees and shrubs, Evergreen trees, grape vines and cuttings, succulent roots, &c. See printed and priced Catalogues, which will be sent gratis, by mail.

☞ Orders will be carefully executed by being forwarded to me by mail, or left with **DUPUY, ROSSER & JONES,** Druggists, Petersburg, Va. and **WILSON & SON,** Norfolk, Va. who act as Agents, and will receive orders at Nursery prices and furnish Catalogues as above.

ROBERT SINCLAIR, Sen.

August 28th.—4a&4a.

MULTICAULIS, ALPINE, AND OTHER MULBERRIES.

Wm. Prince and Sons, proprietors of the Linnæan Nurseries, near New York, are ready to receive orders to any extent for all the varieties of Mulberries, including the Chinese Multicaulis, American Multicaulis raised from Seeds, and very hardy, Expansa, Elata, Alpine, Canton, Broussa, Rose of Lombardy, Dandolo, Pyramidalis, &c., the six first named of which, surpass all others and are placed in rotation according to merit. The prices will be moderate, and terms easy, and priced catalogues will be sent to every one desirous of purchasing. Fruit and Ornamental Trees, and Shrubs, Green House Plants, Bulbous Flower Roots, Field and Garden Seeds.

Rohan Potatoes, &c. can be supplied, and priced Catalogues will be sent to every applicant.

Aug. 31—a4t.

VIRGINIA SILK AGENCY.

The subscriber respectfully informs those engaged in rearing silk, that he has opened an office over the store of Messrs. James M. Radcliffe, & Co., Main street, for the purpose of attending to the silk business in all its various branches, viz.: will purchase, or dispose of for account of the growers, cocoons and silk in all stages, as soon as rates can possibly be fixed; and now offers for sale, Mammoth white, grey, and yellow, two crop white, and six weeks yellow ball silk worm eggs.

ALSO,

Morus multicaulis, in any quantity, now growing in various sections of the state, deliverable on 1st November next, in lots to suit purchasers. The best security will be given for every sale, and the same required.

All communications must be post paid.

J. H. D. LOWNES,
Richmond, Va.,
Agent for the planters.

References.—Dunlop, Moncure, & Co., Lancaster, Denby, & Co., Richmond, Va.

April 30—a&atf

J. J. A. Lynn

THE MOST PRUDENT
AND
Advisable Course.

In as much as there are many very indifferent Piano-Fortes bought and sold by individuals for the want of proper information in such matters, (and that information is absolutely necessary, there is not the slightest doubt, there being an essential difference in the manufacture of Piano-Fortes, well known to sensible and candid musicians,) would it not be the most prudent and advisable course for persons in want of such articles to send their orders to a seller, who keeps such Pianos as have borne the test in upwards of one hundred and twenty instances, where they have been bought and tried by individuals well known for their candor and particularity, a large number of whom have volunteered their favorable opinions; particularly so where the Pianos are sold upon the condition, that if they are not what they are represented to be, they will be taken back or exchanged. The purchaser here has every advantage of gain and nothing to *lose*. When are received orders for Pianos, and the selection is left to myself, I invariably get the assistance of our Music Teacher before deciding as to which instrument I will send. $300, $350 and $375 will purchase superb Pianos.

E. P. NASH, *Petersburg.*

June 30—tf

TO PLANTERS,

On and near the Appomattox.

FORWARDING BY THE
Richmond and Petersburg
RAIL-ROAD.

Produce sent down the Appomattox, will, if so directed, be forwarded by this Rail-Road to Richmond. The Depot Agent at Pocahontas, (Mr. Squires,) will attend to the forwarding from the Basin in Petersburg, and pay the drayage. The Company will not be liable for accidents or losses, except as at present, on its own road. A forwarding commission of 10 per cent. on the freight on this road will be charged by the Agent, and received with the freight and drayage.

Produce sent to be forwarded, should be accompanied by a letter from the owner to the Agent, to be delivered by the boatman at the Depot at Pocahontas immediately on his arrival.

☞ Freight on tobacco $1 per hogshead, on wheat 6 cents a bushel.

Richmond, June 30, 1839.—a&atf

THE MARYLAND
SILK COMPANY,
OF BALTIMORE,

Offer for sale
50,000 Morus Multicaulis, or Chinese Mulberry Trees
10,000 Alpine Mulberry Trees, selected with care
5,000 Canton do. do.
5,000 Rose of Lombardy do.
10,000 Other varieties. Apply to

LUTHER J. COX, Pres't.
March 21.—atf Commerce street, Baltimore

Haller Nutt Esq:

THE

FARMERS' REGISTER,

A MONTHLY PUBLICATION,

Devoted to the Improvement of the Practice

AND

SUPPORT OF THE INTERESTS OF AGRICULTU

EDMUND RUFFIN, EDITOR AND PROPRIETOR.

Vol. VII. SEPTEMBER 30, 1839.

And he gave it for his opinion, "that whoever could make two ears of corn, or two blades of gr
of ground where only one grew before, would deserve better of mankind, and do more esse
try, than the whole race of politicians put together."

PETERSBURG, VA.

PUBLISHED BY THE PROPRIE
1839.

[This publication consists of four sheets—postage for 100 miles or less, 6 c

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PRICES CURRENT--Sept. 28, 1839.

COUNTRY PRODUCE.

	$1 5	to $1 12½
perfine)	5 50	
bushel 65 cents,		
		9 to 12 cts.
Tobacco,	$5½	to $11
do. (lugs)	$3	to $5
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BRANCH, WINFREE & Co.

SILK

ARMERS.

al results, that a hand can
cocoons in a crop of about
crops can be raised in Vir-
Carolina, and more south,
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es. A bushel of good
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, they will go at good
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their letters an-

Morus Multicaulis Trees,

AND

SILK-WORM EGGS.

40,000 Morus Multicaulis Trees, now growing, very flourishing and remarkable for their many branches—they are variously from three to four feet—a part of them are from roots two and three years old. I will sell by the tree, foot, or bud.

100 Ounces Silk-Worm Eggs, principally of the one-crop, large gray Worms—cocoons yellow, and considered a very superior kind—a few of two-crop, white and sulphur.

Persons designing to enter into the Silk Culture, may find it to their interest to make early application to me, as there is now no question as to the superiority of Southern Trees and Eggs over all others. Terms accommodating.

R. P. HANNON.

Petersburg, Oct. 1.—n&at.

SOUTH DOWN SHEEP

FOR SALE.

Eight rams and four ewes, at $35 a piece, if applied for immediately. C. WARWICK.

Richmond, Aug. 27.

THE FARMERS' REGISTER.

VOL. VII. SEPTEMBER 30, 1839. No. 9.

EDMUND RUFFIN, EDITOR AND PROPRIETOR.

From the London Farmer's Magazine, for July, 1839.

ON THE REARING AND FEEDING OF CATTLE.

In our island, where the domestic animals enter so largely into the article of human food, a great part of the farmer's attention must be devoted to the rearing of them to the degree of perfection their ultimate use requires; for every labor bestowed on any kind of cultivation, and every article the farmer produces by the application of that labor, tends to the same result—the production of food for man and beast. Before the introduction of green crops, a very imperfect system of rearing prevailed, from want of succulent food for winter; grass-fed animals could only be brought to market, and if kept through winter they lost during that time the degree of condition they had acquired during summer; for hay and straw if used in profusion will not rear or feed the animals quickly and profitably. The cultivation of green crops has completely altered the whole system, and has introduced an entire revolution, both in the cultivation of the land, and in the management of the domestic animals, a better and more regular supply of food has been obtained, and a vast addition to the number and quality of every article produced on the farm. An improvement in the supply of food carried along with it corresponding improvements in the animals themselves, and on no point of rural economy has more skill and exertion been shown, or more persevering industry exercised, than we have witnessed by many breeders in this kingdom in improving the qualities of the animals, by intermixing and engrafting the properties of the one on the other, so as to develope and bring forth those qualities for the use of man. Our breeds of cattle are numerous, but the various crosses and remnants of old breeds need not be enumerated, and they may be reduced to the few breeds that are now most approved, and from which we may choose for any situation in the kingdom. For all rich soils and favored situations, the Durham breed, or short-horns are preferred, and the long-horns are still kept by many excellent cultivators. The Herefords and short-horns seem nearly balanced in merits, if we may judge from the prizes awarded them. For inferior lands we have the Devon breed, not surpassed by any cattle in the kingdom, and besides we have multitudes of nondescript animals, that do not fall under any class, but which are yet much used in all parts of the kingdom. In Scotland, where great numbers of cattle are reared and exported, the native breeds are three —the Ayrshire which are evidently allied to the Yorkshire breed—the Galloways, or polled blacks, and the West Highland breed of horned black, shaggy-haired animals, which are found, with some little variation, all over the western and northern Highlands of Scotland. Great numbers of these animals are fed in England; and an opinion is entertained, and my own experience goes far in support of it, that these mountain cattle pay more money per head and per acre, than any of our fine breeds, after all the improvements that have been made. The cost of production is small and the beef commands a higher price in the market. In bringing cattle forward to the state when they are disposed of to the consumer, farmers have adopted two methods; some prefer to breed and feed on the farm, a number that the farm can support, and others to buy yearly a number they can afford to feed. The preference given to either of the two methods would seem to be, or should be, determined by locality and other circumstances; yet caprice and fancy would seem to do much, for it is hard to conceive how two farms adjoining each other should be suitable to different modes except in the bare opinion of the farmer, or how two breeds of animals can be most profitable in similar cases, except in opinion only. In many situations the difference to be observed between breeding and feeding, is most marked, and it is very fortunate that the diversity of opinion prevails in other places, for it affords a ready market for our mountain breeds, which if the case was otherwise, might not be so profitable. In choosing a native breed, the farmer will be guided by the quality of the soil, the food he can produce, and by other circumstances, and much will depend on his own fancy; but if he prefer to buy in, rather than breed, it will be found that the Scotch polled and West Highland breed will pay more money than any other. A very general mistake is committed in not allowing them sufficient time on the land, in order to feed—not less than eighteen months should be allowed, or twelve in cases where they have been bought in good condition. Green crops being now known to us, which if duly cultivated will afford succulent food during winter, it is understood that no farmer neglects providing a sufficient quantity if he wishes to rear and feed profitably, not only with regard to the profits of the animals itself, but to the manure raised for the future benefit of the farm. But notwithstanding the long acknowledged profits of these crops and also of improved breeds of stock, we find great neglect prevail on both points; for if we look into Smithfield, or any other market, we find the improved animals bear a small proportion to the others; farmers yet persist in breeding very unthrifty animals, and for want of green crops they are bred and starved upon a system. In many cases, however, we find both breeding and feeding carried on systematically and profitably, with due attention to the profits expected from the animal itself, from the attention and food bestowed, and also to the future benefits expected from the system.

Cow-sheds should be provided with calf-pens adjoining, under the same roof, where the calves are confined in separate apartments for one animal, and floored with boards, pierced with auger holes that they may lay dry and comfortable. From these apartments they are brought twice or thrice a day to be suckled, led by a halter, and tied, when sucking, to a rope extended along the cow-shed. Suckling is always to be preferred to nursing by the pail; when milk is exposed, much of the value is lost, the gaseous fluids go off by evaporation, and the appearance of the calves nursed by the two methods is a sufficient decision. Suckling is attended with less trouble, and an experienced cowman will soon be able to judge of the proper quantity to be allowed them. From January to June is the proper time for weaning—early calves maintaining a decided superiority unless greater encouragement be afterwards afforded to the later ones. In situations where fattening for veal is found profitable, both weaning and fattening go on together; and even where cheese and butter are manufactured, all the three may be easily managed, by allotting a number of cows for suckling and a number to be milked for the dairy. Calves fed for veal must not be restricted in the quantity of milk; for weaning, they must be allowed such a quantity as will keep them always in a sleek and thriving condition, without fatting them, for any fat produced at that time would be lost. An ordinary cow will feed four calves for veal, or make veal of two and wean three, much depending on the milky nature of the cow, and on the quality of the pasture. The various substitutes for milk that have been puffed abroad among farmers have all proved an utter fallacy, only supplying the farmer with a few pounds of butter and cheese at the expense of the animal. They never fail in producing a large belly and offal, an infallible mark of degeneracy and bad keep, in any animal, and in no case have we been yet able to improve upon what nature has provided the mother with in nursing her offspring. During that time the mother should form the chief object of our attention.

In the month of May, when the weather has become warm, and the young grass has sprung, the earliest calves will be turned out into a grass paddock of fine pasture, provided with water and shelter, and convenient to the homestead, and where they can be suckled twice a day. The cow's pasture should be adjacent if possible, and also well provided with water and shelter, and laid down or improved for the purpose. The paddock for the calves may consist of one or two acres, and an orchard suits very well, the fruit trees affording shelter from the heat, and amusement in rubbing. A shelter shed is indispensable, with a dry well littered bottom, and may be so contrived, as to suit for lambing the ewes in the spring, which business will be concluded before the calves are turned out. The ewes lying all night in the paddock, will bestow a good top dressing, which must be attended to by rolling. At the age of 16 weeks the calves will be ready to go to the pasture field, the quantity of milk having been gradually reduced as the calves learned to eat the grass. As they are removed from the paddock the next oldest ones are turned out from the calf-pens, and when the weaning season is near a close, as many of the latest calves as the paddock can maintain may remain in it for the season, to be near at hand for receiving some better encouragement to raise them to an equality with the oldest. Nothing more disfigures a herd of cattle as to see them of different sizes and qualities, and colors, and in many cases of different breeds, showing a great want of skill in the breeding, and of care and attention in the nursing and rearing. After the weaning season is over, the milk for the remainder of the season may be applied to suckling for veal, or to making butter and cheese, as situation may direct. In places where these articles are the staple produce, the weaning of calves will be on a smaller scale; but on these farms some are weaned, to which the above observations will equally apply.

When the calves are removed from the home paddock, the best pasture on the farm will be given them, well watered and sheltered if possible; in many cases the lattermath of a hay crop answers well. When fields lie in permanent grass, a shed with a view to permanency may be erected in each field at a very trifling cost, and may be so contrived as to suit both cattle and sheep. Where the alternate system of farming prevails, a corner where the plough does not strike, may be got, and a very useful shelter erected. Cattle of an age should pasture together, and the smaller the lots the better.

By the end of October, the approach of cold weather will render necessary the removal of the cattle to the home yard. Every farm is, or ought to be, provided with a number of yards suited to its size and to the quality of the soil, the bottoms level with that of the shelter-shed, raised above that of the yard, to throw the moisture outwards, that the cattle may lie dry; cribs for holding the roots given to the cattle are ranged along the subdivision walls, and sometimes placed in the shelter-shed under cover; the most approved are of a square shape with a latticed bottom, which allows all moisture to escape. Buildings of stone and lime have been erected along the walls, but they hold water and sludge very much; wood is cleaner, and where used, the bottom planks should be perforated with holes to discharge the water. Troughs of stone, of wood, or of cast iron, are placed across the division walls, so as to supply two yards; and the water is conveyed in pipes from a pump, or supplied by ball cocks and pipes from a cistern placed aloft for that purpose, in some house of the farmery, and to which the water is raised by a forcing valve in the yard pump. Turnips are now mostly given in a cut state, and where straw is rank and abundant, it may be cut to shorter lengths, which will render it more manageable and easier of reduction.

Into these yards properly furnished, the cattle are put in lots of ages and sizes, varying in number from 3 to 7 when feeding; young cattle may be kept in greater numbers. Most feeders now prefer the open yard to housing, though on turnip farms, a feeding house is very necessary where a few choice animals may be fattened, or a few inferior ones may be brought more quickly to perfection. Fresh straw should be put frequently into the racks, and cabbages are a very proper article to begin the feeding of young stock for the first winter. These and turnip tops are given once, and better if twice a day, and continued through the winter—if they fail, potatoes and beets are given in moderate quantities, so as to keep the young animals in a sleek and thriving condition, without any tendency to gorge them, or induce them to nauseate their food. They should always show a keen appetite, and seem able to eat more than is given. The yards are frequently littered, thinly at a time, so as to keep them dry and comfortable, and also mix the manure properly. The straw racks are shifted often, that the straw may not lie dry around them, and the yards are of such a size as will admit of the cattle treading, dunging, and watering on every part. A very common error prevails on this point, the yards are much too large, the straw lies dry and unmixed in many parts, and the good dung lies huddled together in the other places. Space sufficient for the cattle to move about freely for air and exercise is quite enough, due regard being had to warmth in the shelter-shed. An equal mistake with too much space lies in making the yards too small.

In the month of May of each year the pasture fields will be ready for stocking, when the different sizes and ages will be arranged by the best judgment of the farmer. In October of each year, the cattle will be turned into the fold-yards, and fed with ample allowances of roots and straw, and with the yards kept dry and comfortable. As the cattle increase in age, the fewer numbers must be put together in one yard, and during the third and fourth winter, they will be fed off and sold. I have recommended all calves to suck the cow for veal or for weaning, and I now mention that the treatment of any animal during the first year of its growth generally stamps its future distinction. If it be stinted in the quantity or in the quality of the food, future pampering will not recover its lost growth; and if it be well fed during the first year, and attain a good size, indifferent treatment afterwards will have much less effect. If a calf be well suckled, great attention is necessary during the first winter that it receive such treatment as will carry it forward, and that it does not lose in that time what it gained the previous summer. This result often happens from want of winter food of roots; for though hay and straw be in profusion, they never can supply the place of green crops.

Cattle when feeding must have a full supply of food, but not to pall their appetites, which must always be keen and in full action, The food previously given them should be clean eaten up, or nearly so, before any more be supplied, and the cribs regularly cleaned out and every filth removed. The first feed of cut turnips, potatoes, or beet, is given by the break of day, and the last so long before darkness sets in as will allow time for the cattle to eat the whole during day-light, as any accidents from hoving or choking have a better chance of being seen and remedied. A dry bed in the shelter-shed, and in any part of the yard during dry weather, is indispensable.

Opinions differ as to the most profitable age of feeding our best breeds of cattle. My own experience agrees with the opinion expressed by Earl Spencer, one of our highest authorities, that the age of four years seems the most advantageous, as the most likely to secure the utmost weight of the animal, and to avoid unnecessary expenditure in trying to obtain more bulk, and also the loss by slaughtering at too early an age, before the animal had reached maturity. I have observed that a great part of our cattle are starved on system—they are grazed and gain something in summer, and lose it in winter. The miserable appearance of young stock, both in the yard and in the fields, sufficiently support this opinion, and the case will not be mended till green crops are more extensively cultivated. We know plants adapted I may say to almost every soil, and it only remains to cultivate them. In order to produce a thoroughly well fed and ripe animal it must be gradually fed from the day of its birth, by good keeping, which will keep the body in a thriving condition and full of juices, and also produce that mixture of fat and lean so necessary to constitute beef of good quality. Hence arises the well furnished animal in the hands of the butcher, and from the starving system is owing the bad quality of much of our animal food; for unless the animal be well fattened and regularly, the lean is dry and wholly wanting in juices, which can only be imparted by a ripe state. The one-half at least of our cattle in market are not fat; they are starved in early years, and then for a short time they are tied to a stake and gorged with food to produce an appearance quickly, and sold off to save expense; and hence arises the badly furnished animal in the hands of the butcher. An animal always in good condition is fattening gradually and profitably, the dung is of more value, and when the age of fattening off arrives, a small application of more food concludes the process. A greater number of cattle is often kept on a farm that it can maintain profitably—an erroneous policy, but very common.

I have observed that where a farmer chooses partly or wholly to follow the buying system in place of breeding, it will be found that our small mountain breeds will pay more money than any other. In most cases, too short a time is allowed them to feed, for the natural propensity to fatten has not been in them any way improved by breeding or keeping, and in that respect they differ from our new breeds. They are mostly fed very poorly in their youth, and when transported to rich pastures, fat cannot be laid instantly; but in course of time, if in fair condition, a year will be sufficient, but if bought in a lean state from droves, they should be on the ground for 18 months, fed the first winter on half the full allowance of green food, well grazed the following summer, and fed off the ensuing winter. This is gradual feeding, and indispensible, if we wish for good beef. The age should be four or rather five years when slaughtered.

Oil cake, bean, and barley meal, oats, and other articles have been used in the feeding of cattle, but experience has long since proved that if the farmer will only try to raise potatoes, beet, cabbages, and turnips in quantity, he needs no substitute, except in case of a failure of the above crops. Straw alone is required for litter, and for the cattle to eat a little when inclined. J. D.

HISTORY OF SUGAR.

From the North American Review.

Within the present century has commenced a revolution, which may prove to be of very different importance from what has yet generally been supposed, in respect to a leading article in the commerce and domestic economy of civilized men. It has now arrived at a stage, at which it furnishes some data for answering the questions, how far it is likely to proceed, and what are to be its effects upon the employment, subsistence, comfort and wealth of nations.

The commercial and economical importance of sugar is of modern date. It was known to the Greeks and Romans as a medicinal substance, but not as food or a condiment. Herodotus informs us, that the Zygantes, a people of Africa, had, "besides honey of bees, a much greater quantity made by men." This was probably sugar, but not brought to a state of crystallization. Nearchus, the admiral of Alexander, "discovered concerning canes, that they make honey without bees." Megasthenes, quoted by Strabo, speaks, 300 B. C., of "India stone, sweeter than figs and honey." The Ophrastus, in a fragment preserved by Photius, describes sugar as "a honey contained in reeds." Eratosthenes, also cited by Strabo, and after him, Terentius Varro, are supposed to have meant sugar-canes by "roots of large reeds growing in India, sweet to the taste, both when raw and when boiled, and affording, by pressure, a juice incomparably sweeter than honey."

Near the commencement of the Christian era, sugar was first mentioned under an appropriate name and form. "In India and Arabia Felix," writes Dioscorides, "a kind of concrete honey is called *saccharon*. It is found in reeds, and resembles salt in solidity, and in friableness between the teeth.' After this, so learned a man as Seneca fell back into fable on this subject. His account is this: "It is said that in India, honey is found on the leaves of reeds, either desposited there by the dews of heaven, or generated in the sweet juice and fatness of the reed itself." Pliny, whose special study led him to look more carefully into the matter, gives all that the ancients knew about it, and a little more. "Arabia," he observes, "produces *saccharum*, but not so good as India. It is a honey, collected on reeds, like the gums. It is white, crumbles in the teeth, and when largest is of the size of a hazel-nut. It is used in medicine only." Afterwards Archigenes mentioned it, as "India salt, resembling common salt in color and consistency, but, in taste and flavor, honey." Galen calls it *sacchar*, and says it was "a production of India and Arabia the Blest." The author of the "Periplus of the Erythean Sea" includes it, under the name of *sacchari*, in a list of articles, constituting the commerce between hither India, and the ports of that sea.

If the assertion, that sugar was used in antiquity as a medicament only, needed confirmation, we might find it in the fact, that the subject is not mentioned except by physicans and men of universal learning, nor with tolerable precision by the former. None of them allude to any artificial process in the preparation of it. Ælian, about the middle of the second century, is the first who mentions the use of mechanical art in the extraction of the juice of the cane, and he is likewise the first who attempts to fix the seat of its culture. He tells us, that sugar is "honey pressed from reeds, which are cultivated by the Prasii, a people dwelling near the mouth of the Ganges."

The Jewish histories make no mention of sugar. The only sweet condiment, used by the Hebrews, was honey. But it may have been in part "honey made by men;" for the Rabbins understand thereby not only the honey of bees, but also sirups, made from the fruit of the palm-tree.

During several centuries succeeding the Augustan age, no extension of the knowledge or use of sugar appears to have taken place. It is occasionally spoken of, but to the same effect as by the Greek physicans of that age. So late as the 7th century Paul of Ægina calls it "India salt," and borrows the description of Archigenes.

At this time a new power appeared on the theatre of nations. The Saracens conquered and occupied western Asia, northern Africa, and southern Europe. Their empire was scarcely inferior to that of Rome, in the period of her greatest prosperity and rapacity. They pushed their conquests to the Garonne and the Rhone, to Amalfi, and the islands of the Levant and the Ægean sea.

To these ingenious barbarians the world is indebted for the modern manufacture and commerce of sugar. It is not known at what time they themselves became acquainted with it. Some authors have asserted, that it was not until the thirteenth century, and that the sugar cane and the art of extracting and elaborating the juice, were conferred upon the Europeans by the crusaders, or by the merchant adventurers, who penetrated the Indies after the return of Marco Polo. Each of these assertions has been vaguely received; but a little attention will satisfy every inquirer, that neither of them is true.

We have seen, that several of the ancients, best acquainted with the subject, couple Arabia Felix with India as a source of *saccharum*. Arabian writers of the ninth and tenth centuries speak of sugar as common in their times. In the year 906, the sugar-cane was cultivated, and sugar manufactured, at Ormuz in Caramania, a province of the eastern Caliphate. An Arabian author of the western Caliphate, who composed a treatise on agriculture about the year 1140, and who quotes another writer of his nation of the year 1073, gives full and precise directions for raising canes and manufacturing sugar. From all which, Loudon concludes, that sugar has been cultivated in Spain upwards of seven hundred years, and probably as as much as one thousand years. Salmasius declares, in 1660, that the Arabs had made our modern sugar more than eight hundred years.

One of the Christian historians of the Crusades, in the year 1100, states that the soldiers of the cross found in Syria certain reeds, called *canameles*, of which it was reported that "a kind of wild honey was made." Another, in 1108, says: "The crusaders found honey reeds, in great quantity, in the meadows of Tripoli, in Syria, which reeds were called *sucra*. These they sucked, and were much pleased with the taste thereof, and could scarcely be satisfied with it. This plant is cultivated with great labor of the husbandmen every year. At the time of the harvest they bruise it, when ripe, in mortars, and set by the strained juice in vessels until it is concreted in the form of snow or salt." The same historian relates, that eleven camels laden with sugar were captured by the Christians. A similar adventure happened to Richard Cœur-de-Lion, in the second crusade. A third writer, in 1124, tells us, that in "Syria reeds grow that are full of honey; by which is meant a sweet juice, which by pressure of a screw engine, and concreted by fire, becomes sugar." These are the earliest notices of the method of making sugar; and they refer to an apparatus and to processes used in the Saracen empire, and not known at that time, so far as European records show, to be used any where else. At the same time sugar was made at Tyre in Syria, then subject to the Saracens; and, in 1169, that city is mentioned as "famous for excellent sugar."

The island of Sicily was the first spot upon which the sugar-cane is known to have been planted in Europe, though it is altogether likely, that it was planted by the Moors fully as early, if not earlier, in Spain and Portugal. That island was conquered by the Saracens in the early part of the ninth century, and was retaken by the Normans at the close of eleventh. Immediately after that event we find, that large quantities of sugar were made there. According to records still extant, William, the second king of Sicily, in 1166, made a donation to the convent of St. Benedict of "a sugar-mill, with all the workmen, privileges, and appurtenances thereto belonging."

If it was the crusaders who brought the sugar culture to Europe, how happened it, seeing that they were collected from all Europe, that no other part of that continent except Spain in the hands of the Arabs, and no other island of the Mediterranean except Crete, captured in the year 823, by an expedition from Spain, were favored with that invaluable donation? It was not until three hundred years later, that it found its way into Cyprus, Rhodes, and the Morea, and this extension was not owing to rural tastes, or the spirit of improvement among the feudal barbarians, but to the commercial enterprise of the Venetians, who had for a long time carried on a lucrative trade in the article with India, Syria, Egypt, and Sicily, and were now, by conquest or purchase, the possessors of Crete, and the latter seats of the sugar culture above mentioned.

It may be further remarked, that the most important and profitable of the manufacturing arts have never been propagated except by conquest or emigration. The woollen business was established in England by the weavers, fullers, and dyers, whom the frantic tyranny of the counts of Flanders and their French allies drove, and the wise policy of the Henries and Edwards welcomed, to England. The cotton manufacture, derived to the Arabians from Hindostan, was by them diffused over Africa, and fixed in Europe; and thence brought by an enterprising operative to the United States. It seems scarcely credible that those half-naked, hard-riding demons, who are so often employed in stripping unfortunate Christians to the skin, are the identical people to whom Christendom is indepted for the comfort of a shirt. Such, however is the fact. The Arabs conferred upon us that grateful, and now ornamental garment.

It was not until the time of Justinian, five hundred years after silk was known and purchased at enormous prices at Rome, that the silk culture was brought into the Eastern Empire by two Persian monks, who had pursued it in China. It was established in Italy by a colony of Greek captives, and carried from Milan to Lyons by a company of Italian workmen, engaged by Francis I. Finally, the Huguenots fled from treachery and intolerance to impart their skill to Spitalfields. The silk manufacture is more simple and cheap than that of sugar has hitherto been, and yet it required twelve hundred years to travel from Constantinople to London; and it has but just reached our shores after two hundred years more.

It may help us to form some adequate notion of the difficulty with which the manufacturing arts are propagated, if we reflect how hard it was to naturalize the cotton and wollen manufactures in the United States, and how far they still are from that fineness and finish, to which they attain in the workshops of Europe. Yet we speak a common language, are descended from common ancestors, and have always had close commercial and social relations with our teachers. How much greater must have been the difficulty and delay, if we had been strangers in origin and language, and enemies in religion.

The use of alkalies, in the clarification of the juice of the cane, was an invention of the Arabs. The original raw sugar of the east was debased by a mixture of mucilagineous matter, which opposed itself to the crystallization of the sugar, and determined it to a speedy decomposition after it was crystallized. To this day the eastern sugar, except where the manufacture is directed by Europeans, or where the product has been converted by the Chinese into what we commonly call "rock candy," is much inferior to that of the west in purity, and in strength of grain. The only clarification, which the liquor appears to have undergone in the hands of the eastern manipulators, was by skimming during the processes of evaporation and boiling. And if we may judge from the imperfect and loose descriptions of modern travellers, this is the extent of their knowledge at the present day. They seem to know no other method of clarification in making sugar, and no art of refining except that of making candy.

How the Arabs came to adopt a different method, it is perhaps impossible at this day to determine. Discoveries of this nature do not readily obtain publicity in any country. They are usually involved in as much mystery, and kept under a monoply as long as possible. Another characteristic of the Arabian method was the use of earthen moulds, of a conical form, for crystallizing and curing the sugar. In the east, broad, earthen dishes were used for those purposes. These two characteristics of the Arabian method have come to us through the Spanish and Portuguese; and whence should they have derived them, except from the Arabs, Moors, or Saracens? different names given to the same people from the relations to places and to people, which they successively maintained. *Arabs* (according to a probable etymolygy of the word) means *westerns*, because this people inhabited the *west* of Asia. When they had spread over the north of Africa, and occupied the remotest Hesperia of the Ancient world, the body of their nation was, in respect to the emigrants, *eastern*, and that is the signification of *Saracens*. *Moors* was a name given to them by the Spaniards and other Europeans, from the circumstance of their having conquered and converted the inhabitants of Mauritania or Morocco, incorporated them with their army, and issued immediately from their territory to take possession of Spain, Portugal, part of France and of Italy, Sicily, and the islands of the Ægean Sea.

We have seen, that the Arabs had the art of cultivating the cane, and converting it into sugar. We know that the sugar-canes, called "the chief ornament of Moorish husbandry," are still cultivated in Spain, and the sugar manufactured. It is likewise made in large quantities on the river Suz, in Morocco; and at Teycut or Tattah, constitutes a leading article of traffic with caravans, which traverse the great desert, and Timbuctoo and other markets of Central Africa. Sugar is still a production of considerable importance in Egypt, particularly in the district of Fayoum, and, until lately, the Seraglio at Constantinople was furnished thence with the nicest refined sugar. In 1560, sugar was imported at Antwerp from Portugal and Barbary. At the same period it was an article of extensive manufacture and traffic at Thebes, Daretta, and Dongola in Nubia and Upper Egypt. All these are undoubtedly the remains of the Arabian plantations.

The Spanish and Portuguese word for sugar is *azucar*, *acucar*, or *assucar*, and the Arabic *assokar* or *shuker*. This was derived from the Sanscript, *sharkara* or *sarkara*, meaning, in the primitives *sweet salt*, and giving rise in antiquity to the terms *saccharon*, *sacchar*, *sacchari*, *saccharum*, and "India salt." The Arabic *shuker* is, with slight modifications, a universal term, except in China and the Malayan archipelago; proof enough that we received this commodity, and the art of preparing it, from neither of them, and that we and all the western nations are indebted for it to the Arabs, and through them to the Hindoos. The difference between the Spanish and the Portugese word, and other European names, is owing to the circumstance, that the two nations in close contact with the Arabs, incorporated the article *a* or *al* with the substantive, before which they heard it, as they did in a great many other instances, *algodon*, for example, which is properly *godon*, *goton*, or *koton*. The etymology of *melasses* will furtheir illustrate our position, that we derive the art of sugar making from the Spaniards and Portuguese, and through them from the Arabians. *Melasses*, more frequently, but incorrectly, spelt, **molasses**, is an abreviation of *mel de assucar*, signifying, in Spanish and Portuguse, *the honey of sugar*.

The Portuguese, under the anspices of Dom Henry, transplanted the sugar-cane from Sicily, as it is commonly supposed, though it might be from Portugal itself, to the islands of Madeira and St. Thomas. Herrera has raised great doubt of the historical correctness of the idea, that Sicily was resorted to at that that time for sugar-canes. He declares positively, that they were carried to the Africo-Atlantic islands "from Granada, where they had been planted by the Moors."

It has been a subject of much dispute, whether the sugar cane was introduced into America from Europe, Asia, or Africa, or whether it is indiginous here. The former is the opinion of all the historians of the old world, the latter of all the explorers of the new. Edwards reconciles them by supposing that both are true, which seems to be the most reasonable conclusion. It would be as absurd to suppose, that the early European settlers of America would fail to carry that plant, with whose great value and agreeable uses they had just become well acquainted, to their new abode, especially when they were growing and were worked up in great quantities in the Canaries, whence all the adventurers were accustomed to take their departure, as it would to question the authority of the writers, who positively affirm this fact. On the other hand, it would be an extravagant stretch of incredulity to doubt the clear testimony of the many eye witnesses, who declare, that they found native sugar canes in Guadaloupe, St. Vincent, Brazil, on the La Plata, and on the Mississippi; or the demonstration of Cook and Bougainville, who brought a native and valuable variety from the Friendly Islands, to the British and French West Indies.

It is asserted by some, that the plant was carried from Brazil to St. Domingo, having been previously brought to the former from the Portuguese kingdom of Angola, where it is still cultivated, or from the Portuguese possessions in Asia, where Vasco de Gama and his successors, the conquerors of a great part of India, found sugar cane in abundance. Whencesoever the sugar cane came to St. Domingo, or whether it came at all, it is certain, that a company of sugar makers were carried from Palm Island, one of the Canaries, to establish the manufacture in that oldest, except Brazil, of the American settlements.

It is an interesting fact, that the art of sugar making, propagated, we must conclude, both *east* and *west* from Asia, now completed, in opposite directions, the circumnavigation of the globe; for, a few years after this establishment in St. Domingo, Cortez found, that both sirup and sugar were made from the stalks of maize, by the natives of Mexico, and sold in their markets. The aborigines of Virginia, and probably of all north America, had the knowledge of making sugar from the juice of the maple. From them the Anglo-American settlers undoubtedly derived it.

In 1643, the English began the sugar business in Barbadoes, and, in 1648, the French, in Guadaloupe. The Dutch, expelled from Brazil, where they manufactured sugar in the sixteenth century, took refuge in Cuiaçao, St. Eustatia, and other islands, and finally, upon the exchange of New Amsterdam for English Guiana, in Surinam. To all these they transferred a branch of industry, which they had learned to practice, and knew how to appreciate.

It is not known at what time the use of sugar began in England. It was probably as late as the fourteenth century. At that time it begins to take, in trope and verse, the place which honey had occupied, without a rival, since Moses and Homer. Chaucer uses the epithet "sugreed over." The chamberlain of Scotland, in 1329, speaks of leaves of sugar sold in that country at one once of silver, equal to four dollars of our money, per pound. In 1333, white sugar appears among the household expenses of Humbert, a nobleman of Vienne, and it is mentioned by Eustace Deschamps as among the heaviest expenses of housekeeping. George Peale tells us, that sugar with wine was a common drink in the sixteenth century. It did not become an article of ordinary consumption until the beginning of the seventeeth century. At that period, the Venetians imported it from Sicily and Egypt, and probably produced it in Cyprus, Crete and the Morea. One of their countrymen, about two centuries before, had invented the art of refining, for which he received the sum of one hundred thousand ducats, equal to three or four hundred thousand dollars at the present time. Previously to this they had pursued the Chinese method, and made candy only. This inventor adopted the cones from the Arabians, and probable obtained from their manner of clarification the idea, upon which he so far improved as to effect at last the complete purification of his product. It was from the Venetian refineries, that France and England procured their small and high priced supplies in the fourteenth and fifteenth centuries.

By the creation of sugar plantations in the Portuguese and Spanish islands of Madeira, St. Thomas, and the Canaries, the stock was considerably increased. We begin then, for the first time, to have accounts of the number of sugar mills, and the quantities manufactured. Thus we are told, that in the islands of St. Thomas there were, in 1524, seventy mills, making on an average 66,428 lbs. each, and upwards of two thousand tons in all. It was from those islands, that

Europe was for half a century mainly supplied. But the rapid exhaustion of the soils seems inseparable from the cultivation of the cane with the labor of slaves and serfs. It is reasonable to suppose, that this was the great cause of the successive migrations of this business westward, and its early decline in Sicily, Spain, and the Attico-Atlantic islands.

In St. Domingo there were, in 1518, twenty-eight sugar presses. In about half a century, this island succeeded to the inheritance of the markets of Europe, which it monopolized and enlarged during a century and a half, exporting sixty-five thousand tons in one year, being about 100,000,080 lbs. surplus, after supplying the demand of the mother country. In any possible situation of that island, it could not have maintained until this time that monopoly, and that rate of production. At the beginning of the present century, the entire exportation from the West Indies and American settlements of every description, was 440,800,000 lbs; now it is 400,000,000 lbs. from the British West Indies alone, and 700,000,000 lbs. more from Brazil and the Spanish, French, Dutch, and Danish colonies. In 1750, only 80,000,000 lbs. were exported from the British West Indies, one-fifth of the present export.

Of course the consumption of sugar has greatly increased during the last half century; and it seems destined to an indefinite extension. It is so nutritive, wholesome, and agreeable, that there can never be a limit to its use except in a prohibition or an inability to buy it. Men and nations differ widely in their tastes and habits in respect to most kinds of food, sauce, and drinks. Neither wheat, rice, flesh, nor potatoes can command unanimous favor. No article of housekeeping, save sugar, can be named, which is universally acceptable, to the infant and the aged, the civilized and the savage.

The population of the British West Indies is equal to that of Cuba; but their consumption of sugar was, in 1827, only 13,000,000, lbs., eighteen pounds to an inhabitant, while that of Cuba was, in the same year, 44,000,000 lbs., or sixty-three pounds to an inhabitant. This difference is presumed to be owing to the predominance of the free over the slave population, in the latter islands. The ratio of the free population of Cuba to the slave, is three to one; but in the British West Indies, one to three. This proportion would give the difference of the quantities of sugar consumed, with almost entire accuracy.

The population of all the sugar growing countries in the world is about 468,000,000. It is not to be presumed, that each individual of this number consumes as much as the luxurious West Indian; but it will not be extravagant to suppose, that they all consume as largely as the Mexicans. Mexico, by the lowness of wages, and the ignorance and poverty of the mass, may be considered as a fair representative of the nations, inhabiting that belt of the earth producing sugar canes. She consumes, according to M. Humboldt, ten pounds to an inhabitant, all of domestic production. We thus determine proximately that the consumption of the other Hispano-American nations, and of the swarms which people the east, is 5,000,000,000 lbs. per annum, nearly four times as much as is used in Europe and the United States. Great Britain consumes 400,000,000 lbs., about twenty-four pounds to each inhabitant; the United States 200,000,000 lbs., sixteen pounds to an inhabitant; our domestic production being estimated at 50,000 hhds., or 50.000.000 lbs. In Ireland, the consumption is 40 millions of pounds, five pounds to an individual In Russia, it is much less, being but a little more than one pound to a person, and 60 million in the whole, unless the article be introduced inland from China, by way of Kiachta, as to some extent it probably is. Of the quantity consumed in Russia, we suppose 8 millions of pounds to be beet sugar. Belgium consumes 30 millions of pounds, seven pounds to an inhabitant, of which 5 millions of pounds are beet; and Prussia, Austria, and the rest of Germany, 200 millions of pounds, of which 20 millions may be beet. This is four pounds and a half to an inhabitant. Holland consumes 50,000,000 lbs., sixteen pounds to an inhabitant; Spain, the same, which is but four pounds to an inhabitant; France, 230.304,549 lbs., seven pounds to each inhabitant. Of this, 107,905,785 lbs. were, in 1836, made from beet roots. With the exception of a few manufactories in Italy, the above figures show the extent of the beet sugar culture. Thus we have, for the total consumption of sugar in Europe, 1,267,000,000 lbs., of which 140,000,000, or 62,500 tons, are beet sugar; and, for the total consumption throughout the world, 6.267,000,000 lbs., worth, at six cents a pound, $376,020,000.

The cost of the production of cane sugar varies. It depends mainly on the price of labor. In the east, where labor is from 6 to 10 cents a day, sugar costs to the manufacturer from 1 to 2 cents a pound. In the Americas, where, with the exception of the Hispano-American republics, no wages until very recently have been paid to the laborer, the cost is 3 cents a pound. The price for exportation will average 3¼ cents in the East Indies, and 4¾ in the West Indies and other sugar-growing portions of America. These prices include the profits of the native or resident merchant. The average cost to the importer, exclusive of duty is from 5 to 5½ cents for muscovado and brown sugar, and 7 to 8 cents for white. These prices include freight, insurance, and commissions. Add thereto the respective custom house duties, and we shall have the wholesale prices of every country. Thus the duty in the United States is 2½ cents on brown sugar; add this to 5 and 5½, and we have 7½ and 8, the average wholesale prices of New York, Boston and Philladelphia. The duty on clayed sugar is 3½ cents; add this to the above price, and we have 10 to 12 cents, the ordinary price of white clayed sugars. In France, the duty on brown sugar is 4¼ cents; in England, it is 4¾; consequently, in the markets of those countries, they cannot be at less than from 9 to 10, and 10 to 11 cents respectively. The grocers put on 2 cents more, so that the article costs to the consumer,

In the United States, from 9 to 10 cents.
France, 11 to 12 "
England, 12 to 13 "
Hamburg, a free port, 7 to 8 "

Thus, sugar costs the consumer, in the United States, double the price of importation; and in France and England, two and a half times that price. In Prussia, the duty is the same as in Great Britain; but in Russia, according to the price the article bears there, it cannot be less than 7½ cents per pound.

The consumption of molasses is trifling, except in the United States and Great Britain.—There is some vent for it on the continent, to be used in curing tobacco; and in England it is used for making a bastard sugar, and for cheap preserves. In the United States alone it is used for the table. The quantity of refined sugar consumed in the United States is small compared with the brown. It probably does not exceed one-tenth; while, on the contrary, in France it constitutes four-fifths of the entire consumption. The proportion is less than this in Great Britain; but it is much greater there, and in Europe generally, than in the United States. Brown sugar contains, on an average, three to five per cent. of dirt; of course, molasses cannot be *more* pure. The consumption of this last in the United States, is about 150,000,000 lbs. annually; but probably more than half of it has heretofore been distilled into rum, producing more than 10,000,000 gallons per annum.

The sugar cane appears to have been, in all ages, a source of beverage in some form. Lucan describes the eastern recruits of Pompey's army thus,

—"quique bibunt tenera ab arundine succos"

The Jews had an inebriating liquor which they called *sacar*, from which some etymologists in fact derive *saccharum*, but we think erroneously; because it is certain, that the ancient sugar, with its name *saccharon*, came from India, and equally certain, that the Jews knew not sugar. It is not improbable, however, that some relationship exists between the Hebrew *sacar*, and the Hindoo *sharkara*, or *sarkara*; inasmuch as the drink, expressed by the former, was the juice of a reed, and, before fermentation, sweet. Bruce found the cane used in Egypt and Nubia for making a drink, by concocting it in water. The inhabitants of Angola have made a similar use of it from time immemorial; so too did the ancient Ethiopians. The people of all countries are fond of chewing and sucking sugar canes. The laborers every where grow fat towards the maturity, and during the cropping of the sugar cane. The Arabian horses were observed to grow fat in Spain by feeding on the pulp, after the juice was expressed. Sugar, eaten in considerable quantities, has the same effect. The king of Cochin-China causes his body-guard, consisting of a hundred men, to feed mostly on sugar and sugar canes, in order that they may appear more stout and handsome than other troops. Many aged persons have found great benefit from the free use of sugar. It tends to render the skin and cartilages soft and supple. It might be excellent nourishment for patients submitting to experiments upon distorted limbs or spine. It is slightly laxative, and was valued on that account by the ancient practitioners. Dissolved in water it is an antidote against arsenic, corrosive sublimate, verdigris, blue vitriol, and other mineral poisons, and also those of fish, as lobster, dolphin, conger eel, &c. "Sugar," says the author of "Diet and Digestion," "seems to be the first support of vegetable life, and it is well known to be the principal food of young animals. It perhaps yields more chyle than any other constituent of plants." Sugar, like common salt, is useful after excess in eating. It precipitates digestion, particularly with or after fruits; it excites the secretions of the digestive organs, and is good for old and inactive stomachs. There are many successful examples of aged persons taking it as their principal food during many years. Dr. Rush entertained a high opinion of its dietetical qualities.

But, in proportion as sugar is wholesome, alcohol, which is made from the same principle in plants, is deleterious. The solid and nutritious part of milk is sugar; but, when fermented and distilled, it becomes one of the most inflaming of ardent spirits, i. e. *burning* spirits.

The origin of the excessive importation of molasses into this country, and of the excessive use of distilled spirits resulting from that importation, are among the most instructive matters in our history.

It is but little more than a century since that importation began. In the French West Indies the sugar manufacturers used to throw away their molasses, as indeed they did at first in Jamaica, and as they do to this day in the islands of Bourbon and Java. The New-Englanders, particularly in and about Boston, taking note of this circumstance, induced the French, for a trifling consideration, to preserve this residuum, and deliver it on board the colonial traders. Arrived at Boston and other ports, the adventurers entered the article free of duty, and it was then converted into New England rum. In a few years, the business so enlarged itself, that the trade was extended to the Dutch and Danish colonies. In exchange, our people gave to the Frenchmen and others, horses and mules to work their sugar mills, lumber for their houses, and fish and other provisions for the plantations. In 1715, a few years after the commencement of this traffic, the British island colonies complained of it to the government, as diminishing the demand for their products, and disappointing them of their wonted supplies. Here upon a fierce and protracted contest arose betwixt the island and continental colonies, which was not terminated until 1733, when the islands prevailed, and a duty of 6*d*. a gallon was laid on molasses, and 5s. per cwt. on sugars, imported into the continental colonies from any foreign port or place. The penality for violating the act was to be the forfeiture of vessel and cargo. But the New-Englanders, who had disputed every inch of the passage of the act, seem never to have thought of submitting to it after it was passed; and they continued the old traffic, eluding the duties and defying the law. A British fleet was sent to enforce it, and a state of irritation arose, in which the parties all but came to blows. In fact, this did never cease, from that time down to the revolution; and the famous act for raising a revenue in America was called, in the language of the day, "the sugar and molasses act."

The principal reasons alledged for the trade were that a large supply of rum was indispensable to the continental colonists for carrying on the Indian trade and the fisheries. These reasons have ceased. Rum has nearly finished its mission to the poor Indians; and the fishermen, we believe, generally go upon the temperance plan. The real root of the matter was, and is, that no other people, since the world began, were ever furnished with so great a quantity of exciting liquor for so small a price. The custom house duties, in other countries, either kept out molasses and rum, or admitted them with so heavy conditions, that they could not be afforded in such abundance as they have been here. Ardent spirits were unknown, except as a medicine in the druggist's shop, until the cane sugar and molasses makers of the West Indies brought rum into the world. The taste once formed, demand arose for brandy, perry, gin and whiskey. Anderson, in his 'Origin of Commerce,' remarks: "The consumption of rum in New England is so great, that an author on this subject asserts, that there has been 20,000 hhds. of French *molasses* manufactured into rum at Boston in one year, so vast is the demand for that liquor." Sir William Douglass, in a work printed at Boston, in 1755, tells us, that "spirits, (spiritus ardentes,) not above a century ago, were used only as officinal cordials, but now are become an endemical plague, being a pernicious ingredient in most of our beverages."

The duty of two cents on brown sugar, in the United States, was originally laid for revenue, though it must be considered high for that purpose; being nearly fifty per cent. on the cost. At the time of the purchase of Louisiana, it was advanced to two and a half cents, propably for protection. During the last war with great Britain, it was doubled, being then five cents. At the peace it was fixed at three cents, avowdedly for protection. In 1832, it was brought back to the rate of two and a half cents; and this is maintained for the encouragement of the sugar planters of Louisiana, Florida, Arkansas, Mississippi, Alabama and Georgia. The article is afforded in the New Orleans market, and on the Louisiana plantations, at five to six cents a pound. The planters have repeatedly declared, that, at less prices, the business cannot be sustained. The cost of production, when this industry was most flourishing, was two and a half to three and a half cents, exclusive of the interest on the investment.

We have now surveyed the field of competition in which the beet sugar business must take root, if that be its destiny in this country. It is certain, that the high hopes conceived of it have suffered considerable abatement from experiments made, and views put forth, in Great Britain. These it is our duty to weigh, and to determine how far they ought to influence the resolutions of North American cultivators and capitalists. But it is necessary that we should first examine, with some minuteness, the history and present condition of beet sugar industry.

It is now nearly a hundred years since Margraff, a Prussian chemist, residing at Berlin, made the discovery that the beet contained a good crystallizable sugar. His attention was first drawn to this subject by the saccharine taste of the beet, and the crystalline appearance of its flesh, when examined with a microscope. Having cut the beet into thin slices, he dried perfectly, and then pulverized them. To eight ounces of the powder he added twelve of highly rectified spirits of wine, and exposed the mixture to a gentle heat in a sand bath. As soon as the liquid reached the boiling point, he removed it from the fire, and filtered it into a flask, which he corked up and left to itself. In a few weeks he perceived that crystals were formed, which exhibited all the physical and chemical properties of the sugar cane's. The alcohol still contained sugar in solution, and a resinous matter, which he disengaged by evaporation. Having submitted several other vegetable substances (as parsnips, skerret, and dried grapes) to the same treatment, he obtained sugar from each. In 1747, he addressed to the Academy of Berlin a memoir, entitled 'Chemical Experiments, made with a view to extract genuine sugar from several Plants which grow in these countries.'

Margraff solved the important problem, that genuine sugar was not confined to the cane. After this, he enlarged and varied his experiments, but did not invent means of making sugar from the new material on a scale sufficiently large to render it an object of interest to capitalists. Yet he seems to have had a prescience, that his discovery would one day assume importance. He commended it to the attention of the Prussian cultivators, and particularly the small farmers, as offering a new and beneficial branch of agriculture.

Margraff died in 1782. He was a member of the Academy of Berlin, Director of the Class of Natural Philosophy, and Fellow of the Academy of Sciences at Paris. His works were collected and published in two volumes, octavo, in French, 1767. A German translation was published at Leipsic, the following year.

It was Achard, also a chemist of Berlin, who discovered the method of extracting the sugar from the beet on a large scale, and at a moderate expense. He first announced this result in 1797. In 1799, a letter from him was inserted in the *Annales de Chimie*, in which he detailed his method. He there states the cost at 4¾ cts., the pound of Silesia,—or about 6 cents the pound avoirdupois,—without counting the benefit to be derived from the residuums. He also expressed the opinion, that, with these included, and with some improvements in the processes, this sugar might be produced at half that price. This announcement caused a great sensation in France. It engrossed the attention of the Parisian world; eliciting, alternately, ridicule and admiration. The high price to which sugar had risen in France, in consequence of the capture of nearly all her colonial possessions, gave something more than a speculative interest to the ideas of Achard. The National Institute appointed a commission to examine the subject. The result of their investigation was, that the cost of raw sugar of the beet would be 16 cents per pound. The price of sugar was such, that even at that rate a very large profit might have been cleared; but this consideration was not sufficient to induce many persons to take the risk of a peace with England, supposed at that time to be approaching. Only two establishments were formed; one at St. Ouen, and the other at Chelles, in the environs of Paris. Both of them were failures; partly from the bad quality of their beets, and partly from the ignorance and inexperience of the conductors and workmen. With them went down the high hopes, which had arisen, of this new branch of industry in France.

It is difficult to say, whether these hopes would ever have been resuscitated, if political events of an overruling nature had not supervened. By the Berlin and Milan decrees, all colonial articles were prohibited, and that famous "continental system," so wide and wild in its design, but so important and permanent in its effects, was established. From that time, 1906, chemists and economists applied themselves with renewed zeal to the search after an indigenous source for the supply of sugar. It was thought, at one time, that the desideratum had been attained in the production of grape sugar, or sirup; of which, in the course of two years, many million pounds were made. This sugar, although very abundant in some varieties of the grape, raised in a southern latitude, possesses only two-fifths of the sweetening power of the cane and beet sugar. Nevertheless, sugar being at about one dollar a pound, a great number of manufactories were erected, and science and industry were tasked to the utmost, to improve the processes, and to bring it to perfect sugar.

In this state of things, it was announced, that beet sugar manufactories had been all along carried on successfully in Prussia, It was declared, that from 4 to 6 per cent. of sugar was obtained from the beet, besides several other valuable matters. Other German chemists had insituted experiments, and published results substantially the same as Achard's. At length in 1809-10, experiments were recommenced in France, particularly by M. Deyeux of the Institute, who had reported upon the subject in 1800. The experiments resulted in the production of a considerable quantity of sugar, both clayed and refined, which, as specimens, served to revive and increase the confidence of France in this source of supply. No more than 1 to 2 per cent. was obtained; the beets being of a bad sort, and raised in the neighborhood of Paris, where a vast deal of ammoniacal manure, hostile to the production of saccharine, is used.

In 1811, M. Drappier, of Lille, worked about fifteen tons of beets, from which he obtained 2½ per cent. of sugar. In the winter of the same year, an experimenter at Paris succeeded in obtaining 4½ per cent. from white beets, raised at a considerable distance from Paris, and without any manure. This was the first essay in France which approximated to the results of Achard. It was made by M. Charles Durosne, and was detailed in the *Moniteur*, It demonstrated how faulty had been their selection of sorts, and the mode of culture. At this time, Achard had published in German an extensive work, in which he had treated with minuteness every department of the business, from the raising of the seed to the refining of the sugar. This treatise contained not only Achard's experience of thirteen years, but also accounts of the manufacture of beet sugar, on a grand scale, by other persons in Prussia. The result of these enterprises, as reported by a commission appointed by the Prussian government to investigate the subject, was, that in the case presented to their consideration, 60,800 lbs. of sugar were manufactured from 1,000,000 lbs. of beets, which is 6 pounds 1¼ oz. per cent., costing for cultivation and manufacture, 6.6 cents a pound, and selling at 16.17 cents. The profit was stated at 136 per cent., without reckoning 27,883 gallons of vinegar, worth $1,987 25; 155,400 lbs. of feed for beasts, worth $97 16; and after deducing $1,382 25, for the greater supposed expense of refining beet sugar. This, however, has since been recognized as an error; beet sugar being in fact the most profitable to the refiner, by reason of the superior strength of the grain, and of the deterioration which the cane sugar undergoes by fermentation and decomposition during long voyages and storages, before it reaches the pans of the refiners. This loss is estimated, in France, at 14 per ct. on East India sugar, and at 7 on West India.—The British custom house allows 1 per cent. a month for the waste on bonded sugar.

Such was the result of the operations in the manufactory of the Baron de Koppy at Krayn, near Strehlen in Silesia.

Another course of experiments was instituted by Dr. Neubeck, the royal commissioner, who obtained the following result, working upon a material of one million of kilogrammes.

Sugar, 101, 472 kilg.'s at 16.72 cts. a pound,	$16,985.05
Spirits of wine and vinegar, made from the molasses and pulp,	8,083·38
Mash used for feeding and fattening animals,	189·53
Total.	$25,257·96
Expense,	7,892·25
Net profit,	$17,365·66

Mr. Achard's sugar according to the report of Dr. Neubeck, cost 7.7 cents a pound, and yielded at 16.72 cents, the price of sale, a profit of 8.92 cents a pound. Their beets yielded 4.6 per cent. of sugar.

The experiment at Lille (M. Drappier's) was less successful. He obtained only 1.3 per ct. of refined sugar; and, although this merchandize was then at 35 cents a pound, this price hardly covered the expenses of production, without, however, counting the residuums.

In January, 1812, Napoleon, issued a decree establishing five chemical schools for teaching the processes of beet sugar making, detailing one hundred students from the schools of medicine, pharmacy, and chemestry, to be instructed in those establishments, and creating four imperial manufactories, capable of making 4,408,000 lbs. annually. Munificent premiums were also decreed to several individuals, who had already distinguished themselves by a successful application to this new branch of industry. A considerable number of manufactories were immediately added to those already existing in France; and, in the season of 1813, a large quantity of sugar, both raw and refined, was produced. A notable improvement was introduced by M. Mathieu de Dombasle, a learned and experienced cultivator and chemist. It consisted in applying to the beet juice the colonial process of depuration appropriately called in France *defecation*. This was in fact very analogous to the improvement which the Arabs affected in the oriental method. Achard used sulphuric acid in this operation, and for the crystallization, broad dishes, not unlike those said to be used in China at this day. The colonial process of defecation by lime is now nearly universal in France, as is likewise the substitution of the mould or conical pot, for the crystallizers of Achard.

Such was the prosperous condition of this manufacture, when the disasters of Moscow brought upon it an uncertain political future, the bane of all great industrial enterprises. Confidence and energy gradually yielded to fear and discouragement. A faint and fitful struggle was maintained during another year, until the Cossacks, quartered in the sugar mills, and the allied artillery, seizing upon the beasts that moved them, gave the manufacturers the *coup de grace*. The officers billeted at their houses became from curiosity their principal customers, being struck with the brilliancy and purity of this unexpected product. After the final overthrow of Napolean at Waterloo, the price of refined sugar settled down at 12 cents a pound, and raw at 7. Still, to the surprise of all, two beet sugar manufactories did survive the shock of this tremendous reverse, more useful to this industry, and to mankind, than all its preceeding prosperity; because it demonstrated, what never could have been done under the unnatural stimulus of the "continental system," that there was an intrinsic value in the new industry, rendering it capable of independent existence, and raising it out of the reach of accident, political enmity, or caprice. The establishments which survived were at Arras, in the Department of the Pas de Calais, and at Pont a Mousson, near Nancy, in the Department of the Meurthe.

After the retirement of the allied troops, in 1818, the government began to turn its attention to the encouragement of an industry, which had struggled meritoriously and successfully to preserve a boon to the French nation. Many eminent and public spirited citizens raised up establishments, more perhaps to give the benfit of experiments to their countrymen, than with a view to profitable investment. Men of genius and profound research occupied themselves with elaborate experiments, and published their results. Among the most important were the Count Chaptal, who detailed, in Memoirs, on the subject, and in his 'Agricultural Chemistry,' the experience of many years as a cultivator of beets and manufacturer of sugar; and M. Dombasle, who did the same, with admirable clearness and precision, in his work entitled 'Facts and Observations relating to the Manufacture of Beet Sugar.' The latter, with a prospect of many more years of usefulness, is still at the farm school at Roville, near Luneville, in Lorraine, devoted to agricultural and chemical studies, and imparting the results of his long experience, fertile genius, and assiduous application, through his publications which go to all parts of the world, and to pupils who come from every nation. As an intelligent and industrious operative, M. Crespel Delisse, of Arras, is worthy of honorable mention This gentleman was originally a laborer. He became the foreman of the first beet sugar manufactory at Arras. The proprietor, who had invested an immense capital, sank in the general wreck of 1814-15. M. Crespel suceeded him, with the great advantage of having his fixtures at about one-fourth of their real value. This was one of the two establishments which survived, and it continues to this day to be one of the most extensive and successful in France. M. Crespel is interested as part or sole proprietor in seven or eight other farms and factories. He has received the gold medal of the Society for the Encouragement of Agriculture, at Paris, and the honors of knighthood from the French and other European sovereigns.

The method in general use in France is to crush, or grind, the beet with an instrument called a *rasp*, though its functions would be better described by the word *grater*. It is cylindrical, and revolves four hundred or more times in a minute. This reduces the beets to a very fine pulp. They are then pressed in hydraulic presses of great power and the juice defecated, evaporated, boiled, and filtered, in very much the same manner as the cane-juice in the colonies. The great difference is, that the beet sugar machinery has been rapidly improved, and the cane planters have begun to avail themselves of the improvements. There is, however, another method of extracting the saccharine, which dispenses altogether with grating and pressing. This is called *maceration*. It was first proposed by Dombasle, and has been tried in various forms with more or less success. M. Martin de Roclincourt, originally a captain of engineers, is the inventor of an ingenious and valuable machine for performing this operation. The beet is first cut into ribands, about one line in thicknees. They are then plunged into boiling water, which is admitted into the machine at regular intervals, in regular doses. The ribands remain passing through the circuit of the machine during one hour, and steam is occasionally admitted to keep up the heat. In this time, the sugar contained in the ribands is dissolved, and remains in solution in the water, while the ribands, now called pulp, are discharged on the side of the machine opposite to that where they entered it; the liquor containing the saccharine, flows off in another direction to the defecating pans.

This method is employed to a considerable extent in France, but by no means so generally as the rasp and the press. Its advantages are, that it gives rather more and a rather better product, and requires a great deal less labor. Its disadvantages are, that it takes a great deal more fuel, and does not leave the pulp in so good a state for feeding; there being too much water in it, and less saccharine, than in that which comes from the press. It might be subjected to pressure, by which a little additional liquor would be obtained for the pans, and the pulp made vastly better for feeding. This, however, would require so much power of the press, and so much pains, that the French generally feed with the pulp just as it falls from the machine. We have little hesitation in giving the preference to this method in a country where fuel is cheap and labor dear. The immense establishment commenced in London two years ago, but abandoned in consequence of the excise of 4¾ cents a pound, which the government hastened to impose in order to guard the West India interest, was upon this system. On the other hand, the only other beet sugar manufactory, upon a scale of any importance, in Great Britain and Ireland, which is near Dubilin, has adopted the rasp and press. The former establishment delivered for consumption a considerable quantity of refined sugar, which was so completely undistinguishable from refined cane sugar, that the government issued an extraordinary notice, that any fraud in the exportation of it with the benefit of drawback would, if detected, be punished with the utmost severity. Whether the establishment in Ireland still exists, we are not informed. It is, however, the opinion of persons skilled in the manufacture and refining of sugar, and who have had small experimental beet sugar factories near London, that the business cannot be sustained under a duty of 4½ cents. Others are confident, that, in consequence of the application of the fibre to paper making, by which the value of the pulp is enhanced fourfold, the business will yet get a permanent footing in Great Britain. We do not think a fair experiment has yet been made in that country. The original prejudice against the pretensions of the new manufacture, forced forward by the odious machinery of the "continental system" and the power of the empire, to become a rival of their colonial industry, was of course virulent and obstinate. That it still abides in the mass of the British nation, and in minds which ought to be above it, is apparent from some limited and rather dogmatical views contained in No. CXXXI. of the 'Edinburgh Review.'

The protection of the beet sugar culture in France, and in other nations on the continent, is very high, as we have seen: much higher than protection of any article of general and necessary use ought ever to be. It is at least a hundred per cent. on the cost. But we have also seen, that this business did not succumb to the shock and disappointment occasioned by the fall from a protection of three hundred per cent. to no protection at all. After the general peace, sugar fell as low in France as it is in free ports of Europe at this time. An immense stock had accumulated in the sugar colonies, which had been successively captured, and were in the hands of the British, insomuch that they actually fed horses and other animals upon sugar. Yet, at that very moment, the working classes of Great Britain, under the onerous duty of 6 cents a pound, were drinking their coffee without sugar, as indeed they continue to do, to a great extent, to this day. This is to give a monopoly of the market to the West India planters. Here is folly and extravagance of taxation and protection, which quite eclipse the French beet sugar policy. The Edinburgh reviewer, states, that "the great *impetus* given to it was in 1806." Now, in truth, the beet sugar manufacture *did not exist in France* at that time, nor until four years after, and not then to an extent worth naming. No "impetus" was given to it until the experiments of 1811, and the decrees of the emperor awarding premiums, and establishing schools and model factories, in 1812. Again he aserts, that "in two or three years more, France will be fleeced of £2,600,000 per annum, for the benefit of the landowners of *Alsace*." Such allusions, however slight in themselves, tend to gain the confidence of the reader in the minuteness and accuracy of a writer's knowledge. But Alsace is not a seat of this manufacture; comprising two departments, the Upper and Lower Rhine, it has but five sugar manufactories, while the Department du Nord has two hundred and twenty-six, and the Pas-de-Calais, one hundred and thirty-eight. These errors show, that the writer had not examined the history and present state of the beet sugar business in France, and was not therefore fully competent to pronounce an opinon upon it. His essential error lies in not taking into view the fact, with which he was probably unacquainted, that it has already encountered and survived that test of its utility, which he himself proposes, and before which he says it "would quickly disappear," viz: a free competition with colonial and foreign sugar, and an extreme depression of price.

The condemnation of beet sugar, in the eye of the Scottish economist, is, that it has received protection. Tried by the same rule, what must be the fate of West India sugar, or of any great branch of British industry? Or of the Louisiana cane planters, or of the American cotton and woollen manufacturers, coal miners, salt makers, hat makers, tailors, and shoe makers? The article is, in fact, a dash at *tariffs*. That battle we at present decline, referring the assailant to an abler antagonist in the same journal, about eight years back.

It does not appear, that our contemporary had examined any of the French works upon his subject, except a couple of pamphlets by a merchant of Havre, who was probably interested in the colonial sugar trade, which, when beet sugar arose, was enjoying an absolute monopoly of the kingdom. The beet sugar has reduced the price of sugar in France 25 per cent., and has of course much increased the consumption of the article. The first of these facts is not noticed, and the second is denied. We have often heard the French manufacturers regret, that competition has reduced the price of sugar, since their establishments commenced, from 15 to 10 *sous* the pound; and it appears by the report in the Chamber of Deputies, prefixed to his article, that the sales at Paris alone, from October 1st, 1835, to September 30th, 1336, increased 17,000,000 lbs. But the French Chambers, in 1837, laid a duty on indigenous sugar, which will amount, expenses of collection included, to 1.7 cents a pound. Of course, this leaves the protection in France at 2.55 cents; no more than that which the cane sugar planters of the United States enjoy, and not so much by 6 cents a pound as the British discriminating duty in favor of her sugar colonies!

Will the beet sugar manufacturers of France be able to sustain themselves under this change of policy? This is a question which experience must decide. Undoubtedly, the legislature firmly believed that they would, or they would not have imposed the duty; for the French no more think of sacrificing this interest at home to the colonies, or to any other object, than they think of removing Paris to the island of Martinique. Many of the manufacturers will succumb, because it is a law of political economy, that if a business is better than ordinary, it will cause a proportional rush of competitors to it, a part of whom will adventure without adequate skill and capital, trusting to the goodness of the business to make up for these deficiencies.

The culture and manufacture of beet sugar in France, according to the result of ten cases, which we have examined, has yielded of late years an average profit of 49½ per cent. on capital. In some of these cases the profit was as low as 9, and in others as high as 90, per cent. Now, as the duty of 1.7 cents amounts to a reduction of 22 per cent. on the former rate of profit, it follows, of course, that all those establishments, which, on the scale of profit are below 22 per cent., must go down, unless sustained at an annual loss. Even many of those which would range on that scale above 20 per cent., but which have proceeded principally or wholly (which is not often the case in France) on borrowed capital, trusting to larger profits for the means of extinguishing the original debt, will doubtless fail. The probable number of failures in consequence of the law, was estimated at two hundred, out of a total of five hundred and fifty establishments. Others will probably remove from France, and set up in Belgium, Germany, Russia, or Austria, where protection is greater, and, what is more material, stabler; for those countries have no colonial interest to consult. Opinion is, however, that the law will undergo some modification before it shall have produced this last consequence. These failures or removals, if they shall take place, will not show what protection, or whether any protection is really needed. They will be the natural result of subtracting from a business a protection which it had been accustomed to have, and on which it relied.

But let us consider a moment what are the conditions, under which a manufactory is to go on in France, if the tax shall stand. According to the results of the working of twenty-nine French factories, situated in every variety of locality, the average cost of the production of beet sugar in France is 6.6 cents per pound. The lowest rate, which we find, is 5.9 cents; the highest 8.6 cents per pound. But, in these results, the pulp and molasses are the only accessory products taken into the accounts; and these, only at low venal values, which are not more than from one-third to one-half of what they are really worth, when used with judgment and economy on the spot, without the cost and uncertainty of procuring them from a distance. But there are other accessory benefits, very important in rural economy, which are left out of sight in these accounts. These accessory benefits are:

1. The leaves, which constitute an excellent green feed, which may be used as such from August to November, two or three months; or they may be dried and laid in for winter. They are worth five dollars an acre.

2. The manure, which is found to be increased from three to four-fold on farms where sugar is manufactured. This manure coming from the stables, or from the scums and deposites of the defecating pans, or from the bone-black, which is much used, is of the very best quality, and a portion of it acts upon vegetation with a promptness and energy truly extraordinary.

3. The trimmings of the beets, preparatory to their being submitted to the washing machine. These consist of the decayed parts of the beets, and the forked and fibrous roots, which are cut from them in the process of relieving them from adhesive earths, with which, in most kinds of soil, they will be more or less loaded. Chaptal considers the daily trimmings of 12,000 lbs. of beets sufficient to feed from twenty five to thirty swine, during the manufacturing season. The quantity of beets worked up in the French factories, is rarely less than 20,000 lbs. per day; it is in some more than 100,000 lbs. Many manufacturers merely transport the trimmings to the fields, there to decay, and serve, to some extent, as manure.

4. The ashes coming from the furnaces.—These are valuable, whether sold to the soap boiler, scattered upon the fields, or cast into the farm yard.

It will be readily perceived, that these items are important, and some of them all important to farmers.

M. Dombasle estimates the pulp, and molasses if the first be used by the proprietor, for feeding and fattening cattle, and the second for distillation, as worth 35 per cent. of the whole expenses of a sugar establishment; but he leaves out the four items which we have enumerated above. We doubt not that those are worth to the cultivator as much more; making 70 per cent. of the costs of producing the sugar defrayed by the accessory and agricultural benefits. Let us listen for a moment to M. Crespel Delisce, who thus testifies, February, 1827, before a Committee of the Chamber of Deputies:

"The culture of the beet has increased remarkably the value of real estate. He lately purchased, at the rate of $152 an acre, some lands which were let at $3.80 an acre. Since they have been cultivated with the beet in the rotation of crops, the number of sheep thereon has been doubled, and the horn cattle trebled. In a few years the value of the farm will have increased 50 per cent.

"The rents of leasehold property have been doubled where the land was of a medium quality; and, in case of lands specially adapted to the beet, the rents had been quadrupled."

M. Spineux, another cultivator and manufacturer, belonging to the department of the Somme, tells the same committee, that, "when he took possession of his farm of 350 acres, he believed that it gave a profit of $853. On annexing a sugar establishment, he obtained a profit of $1,425."

M. Chinchain, of the department of the Sarthe, testified as follows:—

"He cultivated about 1100 acres, 550 in beets. He procured one hundred bullocks from Poitou, which he fed with pulp and a little straw. His neighbors, struck with the advantages of his cultivation, came and offered to weed his beets for the weeds; and to dig, clean, and cart them, for the tops. This practice has had the effect of diffusing so much plenty around him, that during the beet harvest, butter falls in price at Angiers, four miles from his factory."

It is the general testimony in the neighborhood of Dunkerque, Valenciennes, and Arras, that real estate has risen 50 per cent. in consequence of the introduction of the beet sugar culture, and wages in nearly the same proportion.

Let not this statement be passed heedlessly by. An advance of 50 per cent. on the value of farms will soon change the face of a country. Land worth $20, becomes worth $30; and land worth $50, becomes worth $75. It is the same as if money should spontaneously increase in quantity, so as to give the lender, at the end of a few years, a principal of $150 for $100, after having yielded him his annual interest.

It has been said, that the opening of the Erie canal had the same effect upon the real estate in the central and western counties of New York. The beet sugar culture is better, because it is at the option of every cultivator of enterprise and industry, whether he will have it or not. It is what the canal would be, if every farmer could by his individual exertions bring it by his own door.

Another important view of the beet sugar culture is, the benefit which it confers upon the soil, by clearing, dividing, and fertilizing it. It fallows without exhausting, and is one of the best preparations for wheat and other grain crops. In a country like France, where seventeen millions of acres, one-fourth of the arable land, lie fallow all the time, the use of this culture, as a substitute for fallows, is a matter of no slight importance.

To consider, then, the beet sugar business merely in its manufacturing aspect, leaving out all these rich results, or to bring as an argument against it some derangement of commerce and revenue, which will of course result from any considerable change, be it beneficial or otherwise, is to entertain a contracted and deceptive view of the subject. We readily concede that, considered as a manufacturing business, without giving any additional agricultural profits, or connecting itself with any agricultural improvement, it is not yet proved that it would be profitable, but that it is highly so, when the manufacture is made subsidiary to agriculture, and fills up the inactive season of the northern winter, we confidently believe, and do not expect any intelligent man to deny. Suppose, however, it should be found, that the pulp is worth, for paper making, five times its value as food for animals; or that the processes and machinery of the manufacture should be so perfected, that the *ten* or *ten and a half* per cent. of saccharine matter, known to exist in the beet, should be extracted and crystallized? In either of these cases, beet sugar making would be very profitable, as a purely manufacturing concern. Now we feel authorized to say, that neither of these improvements is any longer hypothetical. In England, Mr. Kyan, the inventor of the method of preserving timber from the ravages of the dry rot, has obtained a patent for making paper of beet roots, after the juice is expressed. We have seen several specimens of a firm and durable wrapping paper, made of this new material. We are informed, that good printing paper has been made principally of the same substance; and it is confidently expected, that fine writing paper will be produced. The extensive and increasing demand for paper, and the immense commerce now carried on in rags, are sufficient proof of the importance of this application of the beet root pulp.

It is well known to those who have attended to the progress of this business in France. that the profits of the principal manufacturers have been much absorbed by a desire, probably too earnest, to keep up with the improvements of machinery. Much has likewise been lost in unproductive experiments. It would be ungrateful and ungracious to find fault with our French friends on this account; since they have carried the business through the natural and necessary period of infancy, at their exclusive cost, for the common benefit of mankind. They have all along been conscious, that they were obtaining from the beet but little more than half its saccharine matter. This conviction has naturally and very properly caused a restlessness, and a striving after something more perfect. It is certain, that those who have resisted all innovation, and adhered to the original methods and machinery, have been the most successful; but, if all had been equally cautious, little improvement would have been made, and the nation and mankind would have been at a remoter period, and in a less degree, benefited. Nevertheless, we fully believe, that the cotton manufactory has never been established in any country with so few failures, and so little loss and fluctuation, as the beet sugar business in France, and other countries of the continent.

But we now safely assert, that the great desideratum which the French manufacturers of beet sugar have always felt, and have been striving to supply, is at length attained; that a method has been discovered by which the beet is deprived of all its saccharine, be the same more or less, and that this matter is obtained and operated upon in such a manner as to be nearly all in a crystallizable state. Hitherto, about 50 per cent. of the saccharine has resulted in molasses. This residuum is of comparatively small value; and every thing which arrests the formation of it, adds by so much to the deposite of sugar, and to the profits of the proprietors.

Mr. Schuzenbach, a chemist of Carlsruhe, in the Grand Duchy of Baden, is the author of this improvement. Having obtained his result in the laboratory, he communicated it to distinguished capitalists in Baden, who thereupon formed a company; not with the view, in the first instance, of erecting a manufactory upon the new system, but merely of proving its pretensions. To this end, they advanced a considerable sum for setting up experimental works so large, that the thing could be tried on a manufacturing scale. Having done this at Ettingen, near Carlsruhe, they appointed a scientific and practical commission to follow closely the experiments which Mr. Schuzenbach should make. Commissioners from the governments of Wurtemburg and Bavaria likewise attended. The experiments were carried on during five or six weeks, in which time several thousand pounds of sugar, of superior grain and purity, were produced.

The Baden company were so well satisfied with the report of the commission, that they immediately determined to erect an immense establishment, at an expense of more than $200,000 for fixtures only. A like sum was devoted to the current expenses of the work. Factories were simultaneously erected at or near Munich, Stuttgard, and Berlin. The arrangements were made with remarkable intelligence and caution; and we cannot doubt, that the new method will prove of immense importance to the prosperity, comfort, and improvement of the northern nations and colonies of the old world and the new.

DUTCH BUTTER.

From the Genesee Farmer.

Large quantities of butter are annually imported into England from Holland, and some from the same country has occasionally found its way into this. It is justly celebrated for its superior quality, and its power of resisting decomposition, or its not being liable to become rancid. In the Holland dairies, every thing is conducted with a system and neatness, from the feeding of the cows to the completion of the butter, worthy of all imitation and praise. That there is any thing in the climate or pastures of Holland that renders their dairy products superior to those of the rest of Europe, or to ours, is not to be supposed; the difference is clearly in the manipulation, and were our butter and cheese in general, made with as much skill and care as in Holland, we might successfully compete with the Dutch in the West Indies and other markets, to which our butter will now barely pay the cost of transportation. According to the report of Mr. Mitchell, made to the Highland Society of Scotland, the process in the Dutch dairies is substantially as follows:—The milk, when taken from the cow, is poured into large earthen pitchers and placed in a vat of cold water, which quickly reduces the temperature. It is then placed on shelves until the cream separates, when it is taken off and placed in vessels for churning. In these it is first allowed to become a little soured, and then the churn is half filled with the cream. In the best dairies, churning is performed daily; the system being so arranged, that a supply is constantly in readiness. In winter, a little boiled water is added to the cream to give the proper temperature previous to churning; and in very warm weather, it is sometimes submitted to the cold bath to reduce the heat. The butter, when taken from the churn, is put in a shallow vessel and carefully washed with pure cold water, and then worked with a slight sprinkling of fine salt, whether intended for rolls, or for barreling. The butter is considered best, when the cows have been at grass about three weeks; it is then delicious —is made into fanciful forms of animals, pyramids, &c., and stuck over with fragrant flowers, and sells as high as sixteen or seventeen cents per pound. When intended for packing, the butter is worked up twice or thrice a day, with soft, fine salt, for three days, in a shallow tub; there being about two pounds of this salt used for fourteen pounds of butter. After this thorough preparatory working, the butter is then hard packed in thin layers into casks made perfectly sweet and clean. The wood preferred is oak, smoothed carefully inside. Three or four days before they are used, the casks are filled with sour whey, and this stands until they are emptied and cleansed for the packing of the butter. It is clear, from this description, that independent of the perfect neatness observed in every part of the process, the excellence of the Dutch butter, and the ease with which it is kept in its original sweetness when packed, is owing to the manner in which it is freed from the least particle of buttermilk, by the first washing and the subsequent repeated workings, as well as to the perfect incorporation of the salt by the same process. There are many of our American dairies that produce superior butter; but as a whole, that in our markets is a miserable article, destitute of that rich flavor belonging to good butter, and owing to the great amount of buttermilk left in it, utterly unfit for keeping. We believe a reform in these respects, would add materially to the profit of all those who should attempt it, as well as add greatly to the comfort of the great mass of purchasers and consumers.

MILK SICKNESS.

From the Genesee Farmer.

A gentleman at the west has announced, that he has discovered the cause and the cure of this formidable disease, which has been so destructive in some parts of the western states, and has, in some few instances, destroyed or driven the inhabitants from some of the most fertile sections of the country. He is claiming considerable sums from the state legislatures for the promulgation of his specific, and should there be no humbuggery about it, he will certainly be entitled to a handsome reward, in those states where the losses from this cause have already been so great.

There are no traces of a similar disease in any other part of the world; and in the United States it has been princippally confined to Tennessee, Kentucky, Ohio, Indiana and Illinois, though it is believed some few instances have occurred in Wisconsin, and west of the Mississippi. A multitude of speculations have been made as to the probable cause of this fatal complaint, both among medical men and others; and there is scarcely a poisonous mineral or plant to which it has not in turn been attributed. Public opinion at the west seems to have settled on the opinion, that it was produced by a low shrub or vine assuming at times the form of a climber, and bearing bunches of brown berries. Whatever the poison may be, it causes cattle to quiver, stagger, and die within a few hours. If cows eat of it, the milk is poisoned, the butter is also poisoned, and those who partake of either, are as surely injured, as if they had partaken of the original cause itself. The slightest symptoms are vomiting, and this more severe as the quantity of poison is greater, until violent spasms and death ensues. Dogs and wolves who feed on animals that have died with this disease, share the same fate; and to prevent the extending of the evil to dogs and swine, cattle that die with the poison are buried carefully to avoid such results.

In districts where the disease prevails, great care is necessary in killing beef animals, as sometimes the beef will produce vomiting, when the animal is so little effected as to escape notice. To test the presence of the disease, some butchers are in the habit of driving the animal a mile to heat its blood; when if it is poisoned it will exhibit that peculiar trembling so certainly indicative of the presence of the complaint.

In remarking on the formidable nature of this complaint, a writer from the west says,—

"I have seen many farms with comfortable buildings and improvements, entirely abandoned, and their owners fled to other quarters, to avoid this dreadful curse."

But perhaps the most signal instance of its fatality is given in the following extract of a paper from Col. Hinde of Illinois, who has given much attention to the topic:

"Calling to see a friend on Darby Creek, Ohio, whom I had not seen for twenty years, he pointed to his wife and remarked—'she is my third wife; I am her third husband; and in yon grave yard lie fifteen members of our families taken off by that dreadful disease, the puking complaint."

Surely there must be some unusual fascinations in any place that would lead an individual for so many years to encounter so fatal an enemy to life. Should the announcement of the discovery alluded to, prove well founded, it will be a valuable boon to the west, anc save annually great numbers of cattle and many valuable lives.

NATHANIEL BACON. REPLY TO STRICTURES.

To the Editor of the Farmers' Register.

Two papers appeared in your July number, dated at Williamsbnrg, one entitled 'Reminiscences of James Town,' the other 'Bacon's Rebellion,' which latter commences as follows: "An article under this head, published in the Petersburg Intelligencer, states that Nathaniel Bacon (called the rebel) was a member of the council. I doubt it. Where is the evidence?" Having, I believe, contributed that article to the journal mentioned, I think, it may be worth while, to make some inquiry into the grounds on which the statement objected to rests. And as among other authorities, I shall rely upon the Stafford manuscript,* it will be proper first to advert to another portion of the article of your Williamsburg contributor, where he undertakes to discredit to a certain degree, the authority of that manuscript. "This account [the Stafford manuscript of T. M.] may be substantially true, but it certainly contains many errors. It states that Bacon was unanimously chosen a member, and was taken prisoner on his way to that assembly; that he saw him in his seat as a councillor, when the assembly was in session, of which he was a member. There is no instance of a man's being both burgess and councillor at the same time."

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* This *manuscript* may be found published in Kercheval's Hist. of the Valley of Virginia, Introduc. p. xx., Rich. Enq. vol. 1. nos. 34, 5, 6 & 7, and in Lit. and Evang. Mag., vol. 3. p. 130.

The following words related by T. M. author of the Stafford manuscript, as spoken by Lawrence to him, seem to evince clearly, that T. M. did by no means intend to convey the idea, that Bacon was both burgess and councillor at the same time. "Forasmuch as the taking Mr. Bacon again into the councill, was first *to keep him out of the assembly*," &c.

But even admitting that T. M. had stated it, (which it seems manifest that he has not) yet it is not absolutely certain, but that such a statement might have been true, for I find the following resolution:

"May 1st, 1652.

"Whether the governour and council shall be members of this assembly or no; generally voted, *they shall be*, taking the oath the burgesses take." Rand. M. S., Jef. M. S., Hen. Stat., vol. i. p. 373.

Your Williamsburg correspondent proceeds: "It also states, that Sir William Berkley issued a proclamation against Bacon, *prior* to the 5th of June, 1676, when Bacon went down to take his seat in that assembly," and concludes that "the strongest presumption is, that the proclamation against Bacon was issued *after* his attack on James Town." Now T. M's. account in this particular, is confirmed by Keith's Hist. of Va. p. 160, and Marshall's Life of Washington (old edition) vol. i. p. 198.

Again your correspondent objects, "that assembly passed an act disabling Edward Hill and John Stith to bear office." This act charges *them* with being the *greatest fomenters* of the late disturbances, the writer of the above article [T. M.] states that Edward Hill was a member of that assembly."

In answer to this, it may be observed, that there is nothing incredible in the supposition, that Edward Hill while sitting a member of the house of burgesses, was disfranchised. In England, members of parliament, great lords even, have not seldom been translated in a hackney coach, from St. Stephen's chapel, to the tower of London. The case of Sir Francis Burdett will readily occur to the reader.

"It is not probable that Bacon would have been so unguarded, as to go to the legislature, when he was proclaimed an outlaw."

On this it is only necessary to remark, that Bacon had the people and the legislature both on his side; a safeguard sufficient to fortify a less resolute and impetuous man than Bacon.

Such are some of the errors objected to the Stafford manuscript; whether they are of sufficient force to throw a cloud of discredit on that document may be safely submitted to the ingenious reader. The following is Mr. Jefferson's opinion of this manuscript, as contained in the preface thereto: "It appears to have been written by a person intimately acquainted with its origin, progress and conclusion, thirty years after it took place, when the passions of the day had subsided, and reason might take a cool and deliberate review of the transaction. It was written too, not for the public eye, but to satisfy the desire of minister Lord Oxford; *and the candor and simplicity of the narration cannot fail to command belief.*"

This manuscript is relied upon, by Hening Stat. vol. 2. p. 130; Bancroft's Hist. of U. States, vol. 2. grand rebellion *passim.* If then the authority of this manuscript is established, it may be referred to, in regard to the following observation of your Williamsburg contributor: "it does not appear that they [Lawrence and Drummond] were concerned with Bacon *prior* to June, 1676."

On the contrary, Lawrence appears to have been generally considered, at the time, the prime mover and main-spring of the rebellion; "the received opinion in Virginia, which very much attributed the promoting these perturbac'ions to *Mr. Lawrence*, and Mr. Bacon and his other adherents were esteemed as but wheels agitated by the weight of his former and present resentments." Staff. M. S.

I return now to an inquiry, into the grounds of the statement in the Intelligencer, quoted before: "an article under this head published in the Petersburg Intelligencer, states that Nathaniel Bacon (called the rebel) was a member of the council. I doubt it. Where is the evidence?" In reply, I would rely first, on T. M's. account, who says "about a minute after this, the governor starting up from his chair, a third time, said "Mr. Bacon! if you will live civilly but till next quarter court, (doubling the words) but till next quarter court, I'll promise to restore you againe to yo'r place there, pointing with his hand to Mr. Bacon's seat, *he having been of the councill before these troubles*, though he had been a very short time in Virginia, but was deposed by the foresaid proclamac'on; and in the afternoon passing by the court door, in my way up to our chamber, *I saw Mr. Bacon on his quondam seat with the govern'r and councill*, which seemed a marveilous indulgence to one whom he had so lately proscribed as a rebell."

And this fact he reiterates in several different forms of expression, so that it is quite inconceivable that there can be any mistake in the case, especially as it regards so conspicuous a man as the younger Bacon. So that the statement, if not true, must be a downright palpable wilful falsehood, as will be evident to any one who will read the account. But your Williamsburg correspondent does not deny that this account is "substantially true," therefore, unless a document "subtially true" can contain a gross falsehood, it follows, *ex necessitate rei*, by his own admission, and the internal evidence of the document itself, that the statement in question is true.

Nor is it possible to conceive, that T. M. could have confounded the younger Bacon, with the elder, as will appear sufficiently manifest from the following passage in his account: "And so much was true, that this Mr. young Nathaniel Bacon [not yet arrived to 30 years] had a nigh relation, namely, Col. Nathaniel Bacon of *long standing in the council*, a very rich politick man, and childless, designing this kinsman for his heir, who [not without much paines] had prevailed with his uneasy cousin, to deliver the fore-mentioned written recantation at the bar, having compiled it ready to his hand, and by whose meanes 'twas supposed that timely intimation was convey'd to the young gentleman to flee for his life," which passage immediately succeeds the one quoted above, "forasmuch as the taking Mr. Bacon again into the councill, was first to keep him out of the assembly, &c." If it is to be inferred from its not appearing in Hening, that Bacon the younger was not of the council, we must on the same ground infer that Berkley issued no proclamation against him, for I think none such is to be found therein; but your Williamsburg correspondent admits there was such a proclamation issued. There is an *hiatus* in the records of that period; the name of Bacon the younger would no doubt be expunged by the vindictive Berkley, from the list of councillors, even if that list escaped the conflagration of James Town.

There is no impossibility in their being two councillors of the same name at the same time. Benjamin Harrison of Berkley and Benjamin Harrison of Brandon, were both members of the council at the same time, early in the revolutionary period.

The following authorities agree in asserting that Bacon the rebel was of the council. Keiths History of Virginia, p. 156, Beverley's Hist. of Va. p. 68, Marshall's Washington, vol. 1. p. 198, Encyclopœdia Americana, Biographical Dictionaries of Lempriere, and Blake, Article Bacon, Robertson's History of America, p. 424.

I am ashamed to have occupied so much space, on a point of mere curiosity, and in a discussion which I am aware is a little out of the line of your work; the more so, as the article in the Intelligencer consisted of notes scratched off some years since from Beverley's Hist. of Virginia, at a James river seat, where I met with it for the first time, and the misstatement (if one) might safely have been left at his door. But although that writer is often loose and inaccurate, in this particular instance, he seems well sustained, as I trust will appear to the candid reader.

Your most obedient servant,
CHARLES CAMPBELL.

Petersburg, August 9th, 1839.

ON FATTENING HOGS, BY COLD-SOAKED AND FERMENTED FOOD.

To the Editor of the Farmers' Register.

August 31st, 1839.

You complain very justly, I think, that many of your first contributors have grown weary in well doing; in other words, that their communications have greatly fallen off in point of numbers. Although I myself am unconscious of being one of the culprits, I determined immediately upon reading your remarks, to act as if I really was one, and felt anxious to evince my repentance by forthwith inditing to you an epistle of some kind or other; but could think of nothing, at first, that appeared worth communicating; luckily, however, in the midst of this quandary, I picked up at second hand, from a friend, something in regard to the mode of fattening hogs, which seems to be well worthy of notice.

First, however, I must tell you, that having, for a year or two past, enrolled myself in the fraternity of root-steamers for stock, (horses and sheep excepted,) my own experience is not yet sufficient to report to you any result of trials made by myself. I must farther confess that, as a novice in the steaming business, I still retain somewhat of that incredulity which I always feel relative to the benefits of any practice, when they appear to me so exaggerated as those do that are generally ascribed to the steaming process. But being open to conviction, and utterly condemning the old and common wasteful method of fattening our hogs, I was much gratified to hear the account which I will now give you of the mode practised by some gentleman, whose name I forget, in King & Queen or King William.

One or more casks or tubs are nearly filled with alternate layers of chopped cabbages or roots, and broken ears of corn. Enough boiling water is then poured into the vessels, to cover the food. This is suffered to stand about 24 hours before it is given to the hogs, by which time some fermentation takes place, if the fattening process is commenced as early in the season as he commences it, which I understand he does long before frost. A constant supply of this food is given until a very short time previous to the hogs being killed, during which they have corn alone, which is generally deemed necessary to harden their fat.

By this method we may save the expense of steaming apparatus of every kind, such as have been heretofore recommended in our agricultural papers. It is true that some of these cost very little compared to the advantages derived from them; but this little, even in the cheapest that I have seen mentioned, is worth saving, if it can be done by some contrivance still cheaper, and preferable on other accounts, as the one which I have just described, appears to be.

I am gratified that I have it in power to give you the foregoing information at this particular time; for I have long been convinced that we should probably save, at least half the expense of fattening our pork, if we would commence doing it by the first of September, or even sooner, and give much less corn than we generally do. To postpone putting up our hogs for the sake of the acorns and chinkapins that they may be able to find by incessant travelling about in search of them, is as complete an illustration as I have ever known of the old proverb,—"*penny wise and pound foolish*:" since to say nothing of the notorious fact that *hogs especially*, fatten much faster in warm weather than in cold, and when they can fill their bellies without having to travel miles for the wherewithal, (being the laziest animals upon earth, except the gluttonous man, and his prototype, the quadruped called the sloth,) more of them are lost by theft, if suffered to run at large, during the nut and acorn season, than would pay, twice over, the whole expense of feeding them in pens with food that cost us little or nothing, except the labor of collecting and preparing it. Even that portion of this stock which we call "*out hogs*" could probably be kept much more economically, if not suffered to run almost wild for half the year; and were supplied with food by their owners, instead of being left to supply themselves. As they are commonly managed, we may truly estimate the annual loss, in most cases, at nearly or quite half of the whole number; for many are killed for trespassing on our crops—starvation during three-fourths of the year, having taught them to be thieves; whilst a still greater number are stolen in the fall, after they get a little flesh on their bones, for a reason which I once heard alledged by an old negro in extenuation of the practice of stealing them, that "hog meat was so miserable sweet his fellow *sarvants* could not help stealing it."

Hoping that you will deem this new process for fattening hogs worth publishing, I remain, dear sir, Yours very sincerely,

JAMES M. GARNETT.

MEMORANDA.

To the Editor of the Farmers' Register.

New Kent, August 10th, 1839.

As you desire that communications of an agricultural nature should be made to you, and complain of the lack of them, I, a poor illiterate, unpretending humble clod-hopper, venture to offer my mite or mites for a place in your columns, hoping above all things that they may elicit a spirit of inquiry; arouse the latent and dormant energies, and awake the industry of the poor farmers of eastern Virginia. My remarks will be of a desultory nature, and made regardless of the rules for writing.

Chinch bugs.—Whilst some would fain know from whence they came, when, and whither they will go, let us prepare, in the most reasonable and prudent way, to counteract their ravages. That they have done much damage in the county of New Kent, is notorious, but that we may expect they will do infinitely more the ensuing year, is more than probable. During the months of June and July they copulate, and surely nothing ever seen on earth before is to equal the number of nuptials in so short a time; and from the different sizes of their progeny I would infer that they teem but a week. Now, in my opinion, it is not the scalding with water, tarring, or ditching, that will arrest their progress, but the sowing of clover next spring on all the wheat and oats. I made a crop of good wheat this year, when some of my neighbors was not worth cutting. Mine had been seeded down in clover this spring, my neighbors was not.

Marl and lime.—My crop of corn is as good as I ever saw. The land is of a medium nature, neither very stiff nor very light; has been worked (no doubt) long before the settlement was made at James Town, and never improved 'till I commenced with it a few years past. Of course it had become almost steril. I threw on it some lime and some marl, and the alteration is like magic. I give the preference to the marl, mine being of the small-shell kind. I marled some land the past winter, that, heretofore, would not produce ears of corn longer than a man's thumb; now, the corn is excellent; I shall probably gather from it above three barrels per acre. I have been often asked this question, "would you cart marl from Mr. R's.?" My reply has invariably been, "yes, yes; instead of doubting of the propriety of carting marl four miles, I tell you I would haul it from Richmond, a distance of 40 miles, if I had none." I can demonstrate the propriety of my reply. Again, ninety-nine hundredths of farmers marl improperly. They put on too much, which is a very great error. Regardless of the nature of the soil, whether weak or dead, they put on a like quantity; the consequence is, loss of time, loss of labor, and death to the land. A quantity sufficient to counteract the deleterious effects of the acid in the land alone is needed—in general, 100 bushels per acre. On new lands or lands just cleared, five or six hundred bushels might not be too much. In short, marl is destined to be the great regulator of the prices of meats and bread-stuffs in lower Virginia. It is with us the true philosopher's stone, and literally will do for us all the philosophers ever promised, except that of perpetuating life; and even this it will in part do, for, in applying marl we have to labor, which is the soul of health and long life. I see no necessity now of running off to the west or south-west. All who have land and can marl, can make a superabundance here, and although they make in the south-west 10, 15, 30, 40 and 50 thousand dollars annually, every tinker of them returns here every fall, and after getting through with his bragging tables—he takes a man of marl by the hand, and says, "Old fellow! or old friend! walk aside with me. I have thirty thousand dollars worth of cotton; half I have sent on to Mobile, the other half I ordered should be sent on as soon as ginned, and, can you let me have $2000? I will give you any security. I have an immediate want, &c. Can you let me have $1000 or $500?" This has not a good look. Now every good is mixed with evil. We never shall have a dense population. We never will have one large town. If Richmond had additional water power equal to all at Lowel and Pittsburg, it can and will never be large. It is not necessary to give reasons. The evil that I allude to is this, that if marling and improving become general, we shall never sell our corn or wheat. It will be the least profitable pursuit that can be followed. Who will buy? It cannot be consumed among us, for the population is too sparse.

Clover.—Clover is an invaluable plant, and a coadjutor of marl in the important work of improving. With marl it is destined to make our lands produce excellent wheat, oats, rye, &c. It mellows and deepens the soil, makes the earth friable, porous, &c.; and I pronounce it that no man without it can raise a sufficiency of pork. If he does, he pays a shilling per lb. Hogs will grow and thrive on clover from the 1st of May till October. without any thing else but salt. This they should have twice per week. Every farmer who can clover, can raise an abundance of meat.

Hogs.—Hogs should have houses during the winter at least. We have no better, nor indeed any other food for them but corn. Of this grain they are very fond, and it requires a deal of it to keep them through winter. One thing I know from experience, and that is, all pigs should be either killed or given away if they are littered at any other season of the year except the three spring months; reasons are obvious. Those who now keep five sows should keep ten, and permit each sow to carry only four or five pigs at most. When fattening, we should frequently give salt to the hogs.

Manure.—Every farmer may, with ease, raise as much and even more manure at a very moderate price, than it costs him to feed his horses, fatten his hogs, beeves and sheep, &c. I say the manure, if judiciously made, and husbanded, and applied, will more than pay him for all costs in feeding and fattening. Fallow the land and then carry out and spread the manure.

If you receive this hasty effusion, I shall in my next give an account of true nobility, and will show that the reason agriculture has languished in Europe and yet languishes in this republic, is, that in neither country have the great ones set the example. We all know what influence examples in high places have. The patriarchs were the only true nobles on earth. As to the nobility of Europe, its origin is but of yesterday, say six or seven hundred years ago. I intend to show that n former days the truly great ones of the world were not ashamed of husbandry. Cato the censor, David, Saul, Abraham, Isaac, Jacob. Hesiod flourished about 876 years before Christ, and and was the first poet who celebrated agriculture n verse. In our times there are many who would be ashamed to be found engaged in agricultural pursuits. Not so in former days with the truly great. The nobility of England within a few hundred years have done much for the cause of agriculture, and it is in a great degree owing to he efforts of the great landholders of that realm, hat England is at this day the fairest and most fruitful land under the sun. W. X. Z.

VISIT TO THE FARM OF ELIAS PHINNEY, ESQ., LEXINGTON, MASS.

From the New England Farmer.

We have in the farm of this gentleman substanial proof of the efficacy of "book farming." He assured us that his interest in agriculture was irst awakened by reading the N. E. Farmer. Having received a classical education, he has, to be sure, the advantage of our farmers in general, for whom so little has been done by education,—we were prepared, therefore, in viewing his premises, to witness something a little extra, from what may be seen on well cultivated farms in general: but we found that our expectations had not been raised sufficiently high: we were in fact delighted and astonished to be made acquaintnd with the wonderful improvements which have been effected on this place since he began to cultivate it foureen or fifteen years since. It was then a poor worn out farm, covered with rocks, whortleberry bushes, and scrub oaks; while the lowlands were naccessible quagmires and alder swamps, of the most unpromising description—the whole farm, consisting of 160 acres, not affording more than 8 or 10 tons of hay, and all other crops in the same proportion; the fences out of repair, the fruit of an inferior qnality, fit only for cider; and every hing upon the place at sixes and sevens, as the saying is. It does not seem hardly possible that so much could have been achieved in so short a time. It shows what can be done by untiring dilgence directed by science. It is a complete triumph of "book farming" over the old course of husbandry, handed down from father to son. Mr. Phinney has had the boldness to strike out of the old path, and in some instances pursue a course of his own invention. His improvements may be divided as follows:

1st. In planting upon the green sward without disturbing the sod.

2d. In clearing and draining his waste swamps and quagmires, and converting them into the most productive grass and cornfields.

3d. In clearing his uplands of rocks, and laying them into walls of the most durable and massive description—subduing the bushes in the unproductive pastures, and bringing them into fertile fields.

4th. In his orchard of apple trees, which for beauty, thrift, and produce can hardly be excelled.

5th. In his choice collection of fruits of every desirable variety.

6th. In his improved breed of swine.

7th. His barns and accommodations for cattle, swine, poultry, &c.

To which may be added many other improvements of minor importance, but which add to the interest, beauty, and profit of the place.

The idea of planting upon the green sward without disturbing the sod, has been ridiculed by a writer in the N. E. Farmer, vol. 17, page 317—as being impracticable especially in the potato crop. We saw an example of this operation, and one too of a most perfect kind, which we should suppose sufficient to convince the most sceptical. It was in a lot of three acres of potatoes. On the 20th of June there was a heavy crop of grass upon the ground, in addition to which twenty loads of compost to the acre was spread on, and at that time turned over; after ploughing, it was rolled with a heavy roller, (an implement by the way which should be in the possession of every one who calls himself a farmer.) The potatoes were planted in drills—had been hoed but once; yet hardly a weed was to be seen, nor a spear of grass daring to show itself, and sufficient earth, about the plants, with every prospect of an abundant harvest. In the spring this ground will be in fine order to lay down again to grass, and that too without disturbing the sod; or if advisable, planted with corn or any other crop.

Allowing the vegetable matter turned in equal to 20 loads of compost per acre, we have with that spread what is equivalent to 40 loads per acre. No wonder then that by following this process continually, he should be able to cut from 2½ to 3½ tons of hay per acre, which he actually does from his grass lands. He has another idea which we think important for a good crop of grass; that is, to sow an abundance of seed. His rule is 20 lbs. of clover seed per acre, together with a liberal allowance of herds grass and red top to boot. This would astonish most of our farmers, who can afford only from 4 to 10 lbs. per acre.

We saw a field of six acres of corn, from which a crop of 80 bushels to the acre is estimated, and provided we have warm weather sufficient to ripen any corn, we should judge the estimate not too high; the cold weather a few days past, is however against the corn crop. The variety of corn planted is called the Phinney—a fine long eared, twelve rowed variety, and earlier than the Dutton corn, to which it has some resemblance.

In another lot on his peat meadow, we saw a smaller field, on which the corn was more luxuriant and promising than on the one just named, and if that produces 80 bushels, we should not be surprised if this produced 100 bushels to the acre. Think of this, you that own unreclaimed peat meadows, and are longing for the fertile prairies of the west; before you sacrifice your farms and bid adieu to the institutions and hills of New England, make an effort and bring them into subjection: it will prove an antidote to the western fever, or we are much mistaken.

We noticed a fine field of wheat of 8 acres, which the laborers were gathering into the granary. It appeared well filled out: the produce estimated at 20 bushels per acre: it was of the variety called the Black Sea, which we find succeeds best in the vicinity of Boston and most generally cultivated. We were informed that about 30 acres were under the plough the present season. Besides Indian corn, potatoes and English grain, Mr. Phinney cultivates the root crop extensively. His ruta bagas, mangel wurtzels, sugar beets and carrots looked very promising, and will afford an abundance of food for his numerous family of swine, and other stock.

In draining his low lands, Mr Phinney first cuts off all springs from the surrounding hill by a deep cut at the margin or outer edge of the piece, which is converted into a blind ditch: from this most important cut, the drains are made to the centre ditch. Where there is an abundance of stones as in this case, all the drains may be filled and covered over, so that the operations of the plough &c., may not be impeded. We were shown one piece over which it was dangerous for his cattle to pass, and in which they sometimes got mired, before he commenced the draining process; here his first essay on draining had been made, in which, though inexperience, he cut only the centre and cross drains; but with all he did, it would produce nothing but skunk's cabbage, hellebore, brakes, &c.; and it seemed that all his labor had been lost, until he learned the importance of the ditch around the margin, which produced the desired effect, and now it ranks among his most productive grass lots, and a loaded team may be driven without difficulty over it.

We were pleased with his system of digging peat, of which he has an ample supply. Where peat is generally dug, the grounds are left in the roughest state, and present an unpleasant and unsightly appearance, and remain an unproductive waste: but it is his rule to have the top spit, a depth of ten inches or a foot, (the portion unfit for the fire,) thrown over and levelled as the work of digging proceeds: in this way it soon becomes covered with grass, which answers very well for stock hay.

One peculiar feature of this farm is the massive stone walls by which it is enclosed and divided. It would seem a Herculean task to build the wall that has been put up under the care of the intelligent proprietor. In the measurement of the length of wall upon the farm, we may safely say there are miles of it,—we know not how much there may be on this subject we are not informed;—one piece of considerable length is 10 or 11 feet thick, seven feet high, and covered with grapes which have been set out on the south side of it; a fine native variety, found on the place. The vines were loaded with fruit, and bring by the quantity from 8 to 10 cents per pound: we should judge there might be a ton of them. All the other walls are double, from 5 to 10 feet thick and 5 to 6 feet high, and must have consumed an enormous quantity of stone. We noticed grapes upon many other portions of wall.

The orchard on this farm is equal if not superior to any we have seen. It contains from 400 to 500 trees, principally Baldwins, Russets, and Rhode Island Greenings. It produced a very abundant crop last year, but this year there is scarcely an apple upon it. It was planted some where about 14 or 15 years since. The soil is generally a light rich loam, upon a gravelly, and in some places a rocky foundation. The trees were taken from the nursery in autumn, and placed in trenches until the following spring. They were planted near the surface, and in many instances, upon the surface, without digging any holes, and the dirt placed upon the roots. The orchard is situated on a side hill, having a south and south-east exposure. Many of the trees were severely injured by the hard winters of 1835 and '36, which caused the destruction of some of them. Their places have since been supplied with young trees. The mice injured some of the trees a number of years since, by gnawing the bark so that in some cases the trees were completely girdled, and to all appearance lost. An ingenious method was devised to save them. Having prepared some large scions, five or six of them were inserted in each tree below the wounds in the bark, and then connected with bark above by the common operation of side grafting: in this way the sap was conducted from the roots to the top and the trees saved. We saw some of the trees thus operated upon: the scions had increased to the diameter of 3 or 4 inches, and had nearly come in contact with each other: we should doubt, however, whether the trees would be long lived, as the old wood must be unsound, and an early decay must be the consequence. The trees appeared now as vigorous as any of their neighbors. The orchard has never been laid down to grass, but kept in constant cultivation. The trees are finely shaped, having been pruned with a skilful hand, and just high enough from the ground to work under without inconvenience: the trees are about two rods apart: in some places they nearly cover the ground. We do not remember how many barrels were gathered for the market last year, but the quantity was great. Besides this orchard, there is another that has been set out only 2 or 3 years, of 2 or 300 trees, all of which are sweet apples, designed expressively for the swine. All the refuse apples are fed to the hogs, and considered much more valuable for that use than for cider.

The farm is abundantly stocked with pears, plums, peaches, grapes, &c. There are more than 2000 fruit trees of various sorts upon the place, and all have been reared and pruned by the hand of the proprietor himself.

One of the most pleasant sights is a trellis, 30 rods in length, covered with the Isabella grape, from which was gathered last year two tons of grapes, which found a ready sale in Boston market at 10 to 12 cents per pound. The crop was said not to be so heavy this year, but to us it appeared very great. There is also a small house where the more delicious foreign grapes are grown.

The plums had suffered severely from the curculio, and most of the trees had lost their fruit. There is a disease upon the currant bush, which we have noticed in many other places as well as on this. The bush loses its leaves prematurely, and the fruit becomes withered and worthless.

We have in vain sought for the cause. Can any of our readers inform us, and prescribe a remedy? The vegetable garden is large, and well stocked with every variety: what is not consumed in the family is marketed or fed to the swine.

Mr. Phinney has taken great pains to improve his breed of swine, and probably there are none superior in the state. As we have a promise from him of a description of his pigs and piggery for the 'N. E. Farmer,' we shall not enlarge upon this subject. He prefers a cross of the Berkshire and Mackey to any other, and most of his pigs for slaughter are of this description. He has the full blooded Berkshire, Mackey and other breeds, and mixes to suit himself. We noticed a sow lately imported from England, called the Essex half black: the hinder part of the animal is jet black, and the forward half, white. There are some good points about her, and she may prove a valuable acquisition to his stock: not having recovered from her sea voyage, she does not appear now as she will after a few weeks of good keeping. There is an old sow near quite an object of curiosity, (we do not recollect the breed,) that weighs 900 lbs., a monstrous overgrown animal: she had been turned out of her pen to enjoy her liberty a little, which she did not however, seem to appreciate much, as all the room she wanted appeared to be enough to turn round and lie down upon. She looks as though she might be the parent of a most numerous offspring, but we understood she was without issue, having apparently no inclination to form an intimacy with the other sex. The number of swine is about 140, the care of which employs one man constantly.

The barns and other buildings for the accommodation of stock are convenient and comfortable, with sufficient room for the hay and grain produced on the farm. About 100 tons of hay are cut annually, part of which is sold. For every ton of hay sold, one cord of manure is purchased. To improve the land and keep it in high tilth, it is necessary of course to manufacture a large amount of manure. This is done first by the hogs. The man who has the care of them is constantly employed at odd hours in furnishing them materials, such as meadow mud, peat, weeds, &c.: second, by sheep: in autumn 150 or 200 wethers are purchased from the droves, and fed through the winter: by March they are in good flesh, and bring a high price, and pay well for their keeping; their yards being furnished with a plenty of mud and litter, when mixed by their excrements makes a rich compost: third—by the other stock and the manure purchased, which is carefully mixed with twice the quantity of meadow manure. One cord of this compositition is considered about equal to one cord of stable manure alone.

In making our observations upon this place, we feel as if it was not in our power to do it justice, as we spent but a few hours upon it. Every part of it shows, that by science, industry and skill, it has been rendered worthy of being ranked among the first of well cultivated farms in New England, and its proprietor worthy of all praise for the laudable examples he has set for the imitation of his agricultural brethren.

THE ENGLISH [OR JERUSALEM] ARTICHOKE.

From the Southern Cultivator.

We have been requested, by a gentleman of Mississippi, to direct the attention of our farmers to the more extensive cultivation of the English Artichoke, as an excellent article of food for hogs. It is now cultivated by some of our farmers, but upon too small a scale, considering its great value. We learn that Judge Caruthers, and Mr. F. H. Gordon, of Smith county, have about 12 acres each, now growing, which will afford food for near four hundred hogs from the first of November till planting time.

The artichoke requires but little labor in tilling, and is very productive. The roots will remain in the ground safe during the whole of the winter; the stalk and the foliage furnishing an excellent protection from the frosts, and enriching the soil greatly. The hogs can be let on them the 1st of November, and remain till spring, when they will be in prime order. A portion of the ground cultivated should be set apart for seed—the seed to remain in the earth where it grows till spring—then taken and planted about the time sweet potatoes are planted, with about the same amount of seed per acre. Thus four bushels of seed will plant an acre of ground, and require one ploughing and hoeing, and keep 30 or more hogs from the 1st November till spring. If our farmers do not pay more attention to this, they certainly are blind to their interest. Seed, we presume, can be had quite plenty next spring.

RHUBARB, OR PIE PLANT.

From the Genesee Farmer.

This is a valuable plant, and should be found in every garden. The original species cultivated was the *Rheum raponticum*, as was found wild in abundance on the banks of the Wolga, in Russia. Several new species have been found in late years, such as the *R. australe*, *R. palmatum* and the *R. enodi;* but from the earliest ages, the medicinal qualities of the plant appear to have been well understood, and for these virtues it was generally cultivated. Now, though the opinion of its medical efficacy has not perhaps been in the least lessened, it is principally grown for the sake of the stems of its broad leaves, of which extensive use is made in the various departments of domestic cookery. In this country the great demand is for pies, for which they are unrivalled, while in foreign countries the stalks are served up in cream, made into preserves, into tarts, in which form medical men have recommended them as the most cooling and wholesome of any placed on the tables of the opulent, or indeed of any classes. For making preserves, the London Horticultural Register, recommends the following mode. Let the stalks, peeled, be cut into squares, put in single layers on a pan, and placed in an oven of a moderate heat for about twelve hours, and afterwards be put into wide mouthed bottles, with a fifth or sixth part of brown sugar, then covered down with a bladder, and occasionally shaken for the first fortnight.

Of the kinds cultivated, Wilmot's and the Gigantic, numbers 1 and 7 of the London catalogue, are considered the best, as producing the greatest yield and being of good quality; though for some of the more delicate kinds of tarts, Dr. Thompson, who says he has tried all the varieties, gives a decided preference to the palmate leaved variety.

The soil has a very great influence on the qualities of the plants; in a strong or very wet one, the plants will incline to a rank flavor, but if in a light rich soil, they will be large and succulent, without without being unpleasant flavored in the least. Rhubarb may be propagated either by seed or offsets from the roots. The first is generally considered the best method; though the last is much practised, and succeeds well, if care is taken to retain a good bud on the section removed. The ground must be well trenched and manured; the earth rendered fine and well mixed to a good depth, and the seed sown, or the roots set, as early in the season as the earth will allow. If it is intended to grow the plants in the open air, operations must not commence as early as when they are to be forced, a process extensively adopted by gardeners near cities, as bringing the plant early to market.

Rhubarb is forced by means of hot beds, or any of the modes of producing an artificial atmosphere in cold weather, adopted by gardeners; but it is usual to combine blanching with forcing, as giving plants not only of good quality, but of fine appearance. Blanching is accomplished in various ways, all having the same object, that of excluding light from the plants while growing. Large pots turned over the plants, over which manure is heaped, are sometimes used, where blanching and forcing are united. Others cover a bed of plants with an open frame worked of wood, on and around which the manure is placed. This mode is preferred, as giving greater scope to the plants, and by embracing a large area, being less expensive on the whole. Some of those in this country, who have been most successful in the culture of the pie plant, recommend that a barrel from which both heads are removed be set over the plant, and around which the manure must be placed; a board placed close over the top excludes light, and the blanching is effected readily. When additional forcing is required, the top of the barrel as well as the sides may be covered.

Great care must be taken in planting rhubarb, not to have the plants too near. Five or six feet will give better plants than three or four; and it is a good plan to cover the crowns of the plants during the winter with a few inches of rotted manure; thus giving an early start to the vegetation. Little more culture is required after planting, than to keep the beds free from weeds during the summer, and forking in a good dressing of well rotted manure each spring. Dr. Bevan directs that no stalks be gathered the first year, and that they always be cut sparingly towards the last of the season, so as not to exhaust the roots too much. If this is not attended to, spindling weak shoots will be the result.

HOLKHAM, THE SEAT OF THE EARL OF LEICESTER.

From Bentley's Miscellany.

The grounds, including gardens, and park, and forest, and meadows, and fields of corn, are bounded by a circumference of ten miles. Within this circumference is an artificial lake, regarded by many as the most superb in England. Walks and rides intersect these grounds in every convenient direction. Here you move under a triumphal arch; before you, arises soon a lofty obelisk; upon your right spreads out five hundred acres of barley; and anon you enter Lady Anne Coke's beautiful flower garden, planted by the taste of Chantrey. Sheep, whereof here are twenty-two hundred of the veritable South Down breed; cattle, of which there are three hundred belonging to the stock of Devonshire; milch-cows, whereof thirty constitute the dairy; horses, whereof fifty enjoy stalls at Holkham; tenantry, of whom two hundred are happy to acknowledge this excellent landlord; and laborers, of whom two thousand are said to be continually employed by him, meet your eye wherever it is turned; and nearly in the centre of this circumference stands the House of Holkham—a magnificient pile. It was erected about 80 years since by the Earl and Countess of Leicester. It consists of a large central building with four wings, and you are informed that, "measuring closely by all the angles," it is just one mile in circumference. The house is open for public inspection on two days of each week; and well may it thus be opened, for it contains treasures in tapestry, sculpture, and painting, that richly repay the visitor for his time and trouble. In this repect, as a repository of art, Holkham is one of the many valuable houses in England. There is in England no Louvre, England is truly rich in works of art; but they are scattered—a Claude here, a Titian there, and distant a hundred miles or more, amidst sculpture both ancient and modern, may be found a Salvator Rosa and a Raphael.—

NEW REAPING MACHINE—GREAT SAVING.

From the Farmers' Cabinet.

On the 4th of July the farmers of this neighborhood enjoyed the pleasure of seeing the reaping Machine, invented by Mr. O. Hussey, of Baltimore, operate upon a field of wheat. Mr. Hussey had been invited to exhibit his machine before the "*Society of St. George's and Appoquinimink for the Promotion of Agriculture*," and the 4th of July was named as the day, and true to his appointment, Mr. Hussey and his patent reaper made their appearance. Hundreds of farmers were assembled to witness it, and many were the doubts, surmises, and criticisms upon the machine as it was viewed over and over as it lay in readiness for trial. Some time after Mr. Hussey's arrival, the society was called to order, and the declaration of independence was read, while the greatest order and attention prevailed; after which the society adjuorned to the dinner-table and partook of an excellent dinner, prepared for the occasion. These interesting preliminaries being despatched, and all things being in order, *the two strangers* (Mr. Hussey and his machine) were duly introduced to a field of standing grain, ripe and ready for the sickle, and in the twinkling of an eye the machine was off, clipping and cutting, and saving the grain in beatiful style. A cleaner and more even stubble could not be produced. All doubts vanished in the minds of the spectators. Every head of wheat was saved, and the machine was drawn with apparent ease by two horses, and cutting at the rate of from twelve to fifteen acres in a day. The machine was forthwith purchased by the society, and reserved for future trial, which has since confirmed them in the good opinion they had of his capabilities. All who have witnessed it express themselves satisfied, and many are intending to provide themselves with machines for the next harvest. Thus, through the influence and exertions of the agricultural society, we may expect next year to see this valuable labor saving and grain saving machine fairly introduced among our farmers. It is a difficult matter to describe the machine so as to convey a proper idea of its structure; I hope, however, that many will be induced to see for themselves, and they may rely upon having all reasonable expectations realized.

Yours, &c., N.

Middleton, Del., July 15, 1839.

CURE FOR THE POLL EVIL.

From the Franklin Farmer.

Lake Court House, Ia. March 20, 1839.

DEAR SIR—In your paper of the 2nd instant, is a "cure for the poll evil" in its incipient state. Here is a cure for it in its worst state:

When the swelling breaks, or if it has been sometime a running sore, it will have a pipe or tube from which the matter discharges—into this crowd a lump of pearlash or potash, as big as you can with your finger. Three such applications will cure the worst case of poll evil or fistula I ever saw.

Your friend,

SOLON ROBINSON.

TO THE CONDUCTOR OF THE FARMERS' MAGAZINE.

From the Edinburgh Farmers' Magazine of 1807.

Sir,—A series of letters from a young farmer to his father lately fell into my hand, and I take the liberty of furnishing you with a copy of them, trusting they may in some respects be amusing, and perhaps interesting to your readers. It appears that the young man had been sent to learn the art of agriculture in its various branches, under an extensive farmer who resided in a neighboring district; and was employed in the character of a head servant, or as one to whom a particular department of work was entrusted. From a young person so situated, you are not to expect a great portion of information, or many important remarks, though I entertain few doubts with regard to the degree of interest which may be taken in the details given of the several articles of farm business which came under his view. For the sake of connexion, I have arranged the numerous letters before me into four classes, each of which is applicable to the business executed at the different seasons of the year; and I eagerly hope that such an arrangement may be useful and advantageous. I have only to add, that the letters were wrote several years ago, and am yours, &c.

PHILO-GEORGICON.

CLASS 1st.—*Dear Father,*—Agreeably to your desire when we parted, I sit down to give you some account of my reception at Barnhill, where I arrived on the second day of my journey. I found Mr. Jamieson at home, and was received in a kind and friendly way. He first introduced me to his wife and daughters, and showed me the apartment which he said was to be mine during my residence with him. You may believe I was a little discomposed by the sight of so many new faces; therefore Mr. Jamieson kindly proposed a walk for an hour or two through the farm for my relief. The farm appears to be very extensive; but on this point I will afterwards speak with more precision. After work hours, I was introduced to each of the principal servants, who were informed as to the object of my coming to this place, and desired to give me every manner of countenance and assistance in their power. Mr. Jamieson says I am to have a charge also, but has not communicated the nature of it. I shall write down my observations carefully, and send them as opportunity occurs. Bell rings for supper. I find every thing here is conducted in a regular way; and that though all seem to be in a *haste*, yet none are in a *hurry*. I have often heard you illustrate the difference betwixt these two terms, and now believe that I will see it practically exemplified.

February 5.—Mr. Jamieson has this day sown a large field with wheat, which field carried turnips last year, and had been regularly ploughed as the turnips were consumed or carried off. He desired me to attend the pickling process, which was carried on early in the morning by the different sowers, under the inspection of the head ploughman, and executed in the following manner. A quantity of stale urine being provided the preceding evening, and several bushels of hot lime shells laid in the house where the process was to be gone about, the wheat was thrown on the floor in small quantities at a time, and sprinkled with the urine out of a garden watering pan. When something like twenty bushels were wetted, the heap was turned over, and carefully mixed, after which hot lime was riddled upon it; and the like process commenced with another heap, till the whole was finished. Carts were then brought to the door, and the grain taken to the field, where it was soon deposited in the earth. Five sowers and thirty harrows were employed. The whole work was completely over before the evening, and grass-seeds were sown upon the field previous to the harrows going over it the last time. Three double times of the harrows were given; the first in length or for *breaking in;* the second across, which pulverized the ground sufficiently; and the last in length, as a covering to the grass-seeds. It was chiefly white clover and a sprinkling of rye-grass, that were used. The field was, lastly, neatly water furrowed, and presents a most husbandman-like appearance. I have been more particular in this description, because wheat, at this season of the year, is a rarity with you; and I don't remember of having seen you sow grass-seeds so early. I hinted to Mr. Jamieson, that there might be some danger to the seed, from the frosts in March and April; but he answered, that repeated trials had satisfied him that no hurt was to be apprehended. Indeed, experience must be the best guide in this and every practice.

February 10.—Mr. Jamieson is very throng at present, being just beginning his pea and bean seed. He lays down, as a positive rule, always to rise from bed at least an hour before day-light, I mean at this season of the year. By which means, he gets sufficient time to deliver his orders to the several head servants before work hours commence; but his method of doing those things shall be described hereafter.

A few days ago Mr. Jamieson showed me his farm, which, I believe, contains about two thousand acres, apparently of excellent soil; though, at this season of the year, a stranger, especially a novice like me, may fall into great mistakes. It took us four hours on horseback to survey the whole, so you may figure the difference betwixt the extent of business executed here and with you, whose farm may at any time be perambulated before breakfast. He told me, in the course of our ride, that he would, at some leisure hour, give me a sketch of his management. In the mean time he has entered me to business; and you will no doubt wonder that I am capable of a charge so early. Why, then, my business is to oversee the odd men or laborers, that is, the servants not employed at plough or barn-work, or about the live-stock. Mr. Jamieson says he will give me some help till better acquainted with the men, and the nature of their work; but that, afterwards, I must look sharp about me, and see his orders faithfully executed. I intend to use my best endeavors, both on account of honor and interest, because, were I to be negligent, I foresee that my removal would be the immediate consequence, which would not only be disgraceful to my character, in the first instance, but eventually detrimental to my future prospects. In a word, I have got ten men to superintend, which, to be sure, is something like a sergeant's command; and, to keep them tight and tractable, will require all my small stock of prudence and exertion.

The implements belonging to my men have been formally delivered to me with a catalogue of the whole. When *tear* and *wear* occurs, I am directed to mark it down, and produce the broken or disabled implement at the end of each month, when the catalogue will be examined, and the deficiencies supplied. These I consider to be excellent measures; and believe that heavy losses, both from pilfering and negligence, are sustained by most of farmers from the want of them.

I shall furnish you with a copy of my catalogue, which, at least, may amuse you.

10 spades.
10 broad shovels.
10 narrow do.
10 picks or mattocks.
A complete set of quarry implements.
10 pair wool scissars.
10 hedge hooks.
6 pair hedge scissars.
10 strong grapes.
10 small do. for spreading dung.
10 forks.
10 scythes.
10 scythe stones.
30 hay rakes,
10 wheel-barrows.
10 hand-barrows.
6 bean drills.
6 turnip do. of different kinds.

Taking care of these articles, and keeping my *corps* of 10 men at work, I am vain enough to consider as sufficient for me; at least, I am almost certain that one-half of the farmers in the island have not so much to look after.

We must now enter to work. The day after I got my commission, I went to the office with the other head servants. There each got his orders, which Mr. Jamieson, to prevent mistakes, delivers always in writing. Mine were as follows, and I send it to you as a sample.

Orders for George Campbell, Feb. 10.—John Jackson, Peter Simpson, and James Hay, go to the quarry; William Hay, and Thomas Kemp, to plash hedge in Brickfield park; Donald MacLean, Alexander Martin, and John Fraser, to turn compost middens; Archibald Kinnear, and James Dods, to scour ditch at the under end of the Cross-gate park.

This order, with a memorandum concerning the work executed, Mr. Jamieson directed me to deliver to the clerk at night, who then enters it in the books. This you will say is going very regularly to work; but where so much is to be done, there is a necessity for method, otherwise confusion would be the consequence.

Our head ploughman tells me, they have sown 20 acres with peas this day, which are all done off and water-furrowed. He says the ground harrowed tolerably well, and left a round clod upon the surface. I understand that beans are to be drilled to-morrow, six of my men being directed to wheel the drill-barrows.

February 16.—Mr. Jamieson's business now begins to open upon me. He really manages a great deal of work, and does every thing without noise or confusion. He is indefatigable himself, and takes a great deal of fatigue; but keeping little company, and that only of sober people, he is almost constantly employed one way or other upon his farm; and when he has visitors, his way is so well known, they never trouble him with bad hours. He is an early riser, laying down for a rule, as already mentioned, to have all his orders delivered before the working people attend. His house is well furnished, and abundantly supplied with good victuals of all kinds. There is one table kept for himself and family, another for the head servants, and a third in the kitchen; and a full supply is regularly presented at each.

He sent for me last night into the parlour.—Well, George, said he, how do you like *your* office? Pretty well, I replied, sir, providing I fill it to your pleasure. Why, not worse than might be expected from a beginner. Time and attention, I hope, will produce improvement. But sit down. I promised to explain, some day or other, my mode of management, and, having a leisure hour, shall be as good as my word.

This farm contains altogether about two thousand acres; and, when it came into my possession, was divided into eight separate farms; but, as I had long entertained an inclination to try farming on a large scale, I ventured to take the whole, though at the time in miserable order. Indeed, it has always appeared absurd to me, that the occupation of a farmer should, by custom, be restricted to certain bounds, while the merchant or manufacturer is encouraged to extend his trade or business proportionally to the extent of his capital stock. With these views in my head, and a decent sum of money in my pocket, I settled here, and proceeded to realize my former opinions. This house, and all the adjoining offices, were erected by me, the old houses and steadings being widely scattered over the ground, and of little use, except such as were preserved for cottages. You see I am tolerably well provided with accommodation of every kind, both for a great number of servants, and a large stock of bestial, which things are absolutely necessary, if farming is meant to be carried on with comfort and profit. My landlord aided me in the buildings, by furnishing one thousand pounds; but the sums I have expended, at different times, are three times above the amount of the assistance thus obtained; though I don't grudge such expenditure, because I consider every half-penny of it to be well applied.

It required a considerable time before I got the farm arranged to my mind, much of it being formerly run-rig, and intersected by balks. However, by summer-fallowing to a great extent, and throwing in plenty of clover and rye-grass, I, at last, got the whole into regular breaks of one hundred acres each. Part is enclosed, and a considerable proportion remains open field; but this I don't view as attended with much detriment, where corn is the chief object. The enclosures that I have are good; and this I consider as of more importance than having many of them.

My method of cropping is very simple, and regulated upon this principle, that the earth delights in variety; therefore, I chiefly follow what is called the alternate husbandry. As for a regular rotation, in the strict sense of the term, I never followed any thing of that kind, but limited my mode of cropping to a sequence of white and green crops, without studying particularly what variety of each was to be cultivated; and abstractedly speaking, to take culmiferous and leguminous crops alternately, I hold to be the *ne plus ultra* of good farming. No doubt this plan at times has been broke through, because seasons and other circumstances have rendered a departure from it necessary; but where it can be adhered to without material inconvenience, I am clear that the departure therefrom should be carefully avoided.

My last year's crop consisted of 250 acres of wheat, whereof 100 acres were after summer fallow, 50 acres after turnips, and 100 acres after beans and peas; of 150 acres of barley, whereof 50 acres were after turnips, and 100 after beans and peas; of 300 acres of oats, whereof 100 acres were after clover, cut and used in the stable and straw-yard, and 200 acres after pasture grass; of 200 acres of beans and peas, most of them drilled; 100 acres of clover and rye-grass sown amongst fallow wheat; and 800 acres of pasture grass. These, with 200 acres in summer fallow, turnips and potatoes, comprehended the whole of my farm, and in my humble opinion, made the system so complete as almost to ensure a succession of good crops.

You will attend, that as I sow grass seeds along with the grain that succeeds summer-fallow and turnips, and also with 100 acres of barley, which followed drilled beans, I am enabled to retain the like number of acres each season in grass; because three breaks of grass, one after cut clover, and two after old pasture, are ploughed in each year. This gives a regularity to labor, always desirable; and serves, under a parity of circumstances, to keep the whole of my farm in equal and uniform good order. I by no means, however, adhere to the number of acres in each grain condescended upon as forming the crop of last year, because I have sometimes taken wheat on the clover break, and at other times have substituted barley for wheat on the breaks which had carried beans and peas. My aim is to have culmiferous and leguminous crops alternately; and this being attained, I am not rigidly studious to preserve the quantities of each already mentioned. If I have 700 acres in white crops, 1200 acres under leguminous crops, and 100 acres in naked summer-fallow, I am perfectly satisfied.

I hope that a kind of rough view is given of my farming system; and at a future time, shall be ready to afford any explanation which you may suppose to be necessary. I never thought farming a mystery, nor do I think that good can arise from keeping any branch of it secret and concealed, as attempted by many of our brethren. My opinion is, that the more generally a knowledge of husbandry is diffused, so much more will the public be benefited; and that the man who has gained wisdom in the school of practical experience, and refuses to impart a share of it to others, acts a part not less inimical to the public good, than he who, having discovered a remedy for a pestilential disease, obstinately keeps the secret to himself, without benefiting society by the discovery.

The above is the substance of Mr. Jamieson's conversation. I really think him a sensible man, and, although quiet, yet, by an active turn and disposition, eminently qualified for the line of life he has chosen. You may be assured that I shall study to cultivate his good will, being certain that the possession thereof will tend much to my advantage, though equally sure that it is not to be gained unless attention to business is punctually bestowed.

I forgot to mention, that the first day I entered to business, Mr. Jamieson accompanied me through my several stations, and gave me particular directions how each branch of work was to be executed. He also instructed the men to give absolute obedience to my orders, and to act under me with the like promptitude and discretion as if he were on the spot himself. I am authorized to dismiss immediately any one who acts unfaithfully, or neglects his duty; but this authority shall be administered with prudence, though with justice to the interest of my worthy employer.

February 28.—I am sending letters very frequently; but were I to do otherwise, one third of what I learn every day could not be communicated. The obligation conferred in sending me there is great indeed; and assuredly, if I am not taught farming in all its branches sufficiently, it is not for lack of opportunities.

It was stated in a former letter, that Mr. Jamieson had several head servants, to whom his orders were entrusted. I am now well acquainted with them all, and shall attempt a description of each, and their respective duties.

The first is the head ploughman. His name is James Elliot. He is a middle-aged man, is a complete ploughman, perfectly capable of teaching an ignorant fellow to manage the plough in the best style, and, in short, qualified to execute every branch of field work. He has eighteen ploughs under his inspection; seldom works himself, but accompanies the ploughs to the field, and sees every thing properly executed. He feeds the horses, has the charge of all work done by them, and of all the implements which appertain to that department.

The second head servant is Ralph Howard, who is a thorough judge of live stock. He has the charge of the whole sheep and cattle kept on the farm, and attends markets either for buying or selling. He has six herds and feeders below him.

The third head servant is John Fairbairn, who superintends the stacking, thrashing, and dighting of the corn; also the stoning of grass land, weeding the corn fields, gathering quickens, &c. from the fallows, &c. &c. He has four men and five women constantly under his charge, and occasionally a greater number of the latter as may be called for by the work to be executed. Draughts are often madé from my *corps* to assist him, especially when the thrashing machine is employed.

The fourth head servant is the clerk, whose work is the easiest in one sense, but most fatiguing in another. He writes out the orders,—posts the books,—rides upon business,—receives money,—and pays it away as ordered. Every night he gets reports from the other head servants; and upon Saturday, settles accounts for the past week with Mr. Jamieson.

The fifth head servant is your humble servant, and the nature of his office is already explained.

You would be surprised, notwithstanding the number of people employed, and the multiplicity of business executed, to see in what order and method every thing goes forward. In fact, every headsman may be considered as a separate farmer; with this beneficial difference, that his attention is in a great measure directed only to one object; whereas, in ordinary cases, the attention of a farmer must be displayed upon multifarious articles of business, some of which, of course, stand a chance of being neglected. Mr. Jamieson insists, in the most pointed way, that none of us shall interfere with the business of his neighbor, or even go near each other during work hours, unless when directed by him. He maintains that these rules are not only necessary to support good government, but even to preserve unanimity amongst ourselves. I believe he is in the right, and shall walk accordingly.

Elliot is always first up in the morning, having his horses to feed; and rings a bell placed on the top of the granary, which summons his men to the stables to feed and dress the horses; after which breakfast is taken. In the mean time, he goes to the office, and receives orders for the day, with which he instantly returns, and distributes among his ploughmen. In good weather this is an easy task, because the whole are usually kept together; but, in bad weather, the scene is changed, and a greater division of orders becomes necessary. Howard, after receiving his orders, goes to his herds and turnip-feeders in the byres; Fairbairn to his barns; and me to my old fellows, who assemble in a shade adjoining to the house, where their implements are deposited. Mr. Jamieson goes where he pleases, and superintends the whole.

At night, after work is over, we go to the clerk's office, and give in our reports, which are entered in the journal for Mr. Jamieson's inspection, who, from these vouchers, and obsevations made by himself, determines upon the orders for next day. When money is wanted,—as every headsman pays the people employed in his department—we make out an account, which is shown to Mr. Jamieson. If he is pleased to order payment, the pencil mark of "*pay*" is affixed, and we go to the clerk who takes our receipt at the foot of the account, and delivers the sum wanted. These accounts are kept by the clerk till Saturday evening, when Mr. Jamieson takes them off his hand. By attending to these methods of carrying on business, I am bold enough to say, that the affairs of this farm are regularly conducted, and with much less bustle and confusion than on farms not a sixth part so large, where order and precision are neglected. You will be well pleased with these particulars, being a lover of regularity, and a keen friend to systematic arrangement in executing every kind of business.

March 4. Mr. Jamieson desired me to take a walk with him this forenoon, which I did with much pleasure. We went to a field where Elliot was drilling beans, his whole eighteen ploughs and six drill barrows being employed; and a noble sight they made. 'Elliot,' says Mr. Jamieson, 'have we a prospect of obtaining a good crop here? 'In my opinion,' replied Elliot, 'we have a fair chance of it; the land is rich and clean; and if the season is not against us, eight or ten bolls per acre may be expected.' 'Pray, Mr. Jamieson,' I said, 'how many beans will you sow here?' for I could hardly see to the end of the field. To which he replied, 'There were just one hundred acres in the break, which may require from 130 to 140 bolls of seed.' 'And what time may it take to plough and sow the whole of that quantity; ' 'Elliot' says Mr. Jamieson, 'how long have you been here?' 'Why, Sir, two days before this one; and I am tolerably certain that, in three days more, if you allow the whole strength to continue, we shall have the field finished.' As this was nearly an acre per plough per day I expressed some amazement at the quantity of work executed; but Elliot said, that a pair of good horses with a light furrow, such as should be given to covering beans, were unprofitably employed, if they did not turn over an acre per day, at two journeys of four hours and a half each. So much for the despatch given to business at this place.

We went from the bean field to the land intended for oats, which Mr. Jamieson thought to be in good condition for receiving the harrow; and added, that the moment his bean seed was over, he would strain every nerve to get his oats deposited in the ground as speedily as possible. He informed me that his earliest oats, though often of least bulk, were always more prolific than those latter sown, and that a day at this season was of incalculable value. Here ended our walk; and I went to a detachment of my old fellows, employed at turning a compost midden, the remainder being with Elliot wheeling his bean drills.

Howard tells me, that he has got a few lambs, and expects, ten or twelve score more, before eight days are over. The ewes, I notice, have got a supply of turnips lately on their pastures, which Mr. Jamieson assures me, is absolutely necessary at this season, if good lambs are to be reared. It is the New Leicester or Bakewell sort of sheep that are chiefly kept here, and they are quiet and docile in disposition, beyond any sheep that hitherto have come under my observation.

March 20.—Our oat-seed is finished this day; and when I tell you that three hundred acres have been sown, you will allow that no idle bread has been consumed, either by men or horses. I noticed that thirty-six harrows were employed, and learn from Elliot, that above thirty acres were, on an average, finished in each day, a good part of it having to get four double times of the harrows. He added, that when grass land is not very tender, he makes it a rule to go over it two times in length, before he drives the harrows across; and this is done so as the furrows may not be pulled back, and the sward brought into its original position, which hurts the crop exceedingly. I understand that about one half of the early varieties are sown, and the other half of the kinds called Angus and Blainslies. I ventured to inquire at Mr. Jamieson which of the sorts were most profitable; and he was so good as to inform me, that both had their properties, though as the early ones generally yielded the greatest quantity of grain, he was partial to them; but that as the others produced most fodder, which was an important object with him, he was led to sow them in equal proportions; and that, in this way, his harvest work was divided, and much hurry and hazard avoided at that period. This, to be sure, is a matter of importance, therefore deservedly viewed in that light by so celebrated a husbandman.

Our turnip-fed sheep are all gone off; and the field which carried turnips forthwith to be cleared, and the remainder of the crop brought home, so as the ploughs may be entered preparatory to the sowing of barley. It seems that the charge of topping, tailing, and building of the turnips, is to be entrusted to me, and of course that my squad is to be employed in these operations. Howard informs me, that about thirty of the turnip cattle are still on hand, and that these, and the stock of ewes, will consume all the turnips that remain; though, he adds, that they are losing their nutritive quality very fast. Mr. Jamieson continues to favor me with his approbation; and my fellow servants, particularly Elliot, have shown a steady desire to give me every manner of assistance. In a word, my time here is not only usefully but agreeable spent, and I thank you once more for placing me at such a school.

April 8.—The barley after turnips is at last sown, though the work gave Elliot more trouble than he expected. Owing to a sudden drought, the ground turned up with a *heel*, as he called it; so a cross-ploughing was first given; then, after harrowing it, rollers were applied; and finally an ebb seed furrow; when it was sown with early barley and grass seeds. The field looks well to the eye, being finished in a most husbandman-like style; but upon talking to Elliot concerning it, he shook his head, and said, he seldom saw good barley after turnips, when the land required to be *forced*; and that he will pawn his word that we have better barley upon the break that carried beans last year, which he is forthwith to seed-furrow. He says that he means to sow this field *green*, or after the plough, and not allow it to spire and lose brairding sap. The field to be sure is clean, and perfectly free of quickens; so I dare say the method meant to be taken is a good one. Fairbairn and his women, for several days, have been gathering stones on the break of clover intended for cutting; and my *corps* have digged a number of drains in the adjoining field intended for summer-fallow, into which the stones are deposited. Three carts are employed to drive the stones, which are instantly put into the drains; and while Fairbairn superintends the gathering process, the task of filling in and covering up, is committed to your humble servant. We work five hours in the orenoon, and four in the afternoon, and go merrily forward.

Class 2nd.

May 9. My residence with Mr. Jamieson continues to furnish me with instruction in every branch of rural work; and nothing has occurred to obstruct or lessen the enjoyment repeatedly expressed in my former letters. My master is kind and communicative. My fellow servants join in promoting his views to improve and instruct me; and hitherto the slightest difference has not taken place betwixt me and any of the numerous body of people belonging to this extensive and well regulated undertaking.

Yesterday Mr. Jamieson desired me to accompany him in his ride to examine the winter sown wheats. The break of one hundred acres, after summer fallow, upon which grass seeds were lately sown, looked astonishingly well. It had been thinly seeded, a practice Mr. Jamieson is fond of upon well prepared ground, and was tillering or stooling with the greatest vigor. The ear is already fully formed; though Mr. Jamieson says it will not come out of the *shot blade* in less than a month. He added, that smut or black may be observed in this early stage,—though after the most attentive investigation the smallest sign of that abominable disorder could not be discovered.

The field of wheat after beans appears to be considerably thicker seeded than the one after fallow; and the reason assigned by Mr. Jamieson for the difference was, that upon a bean stubble, the plants rarely gather so freely as those upon a well wrought fallow fresh impregnated by manure. I noticed, however, that this field was green and thriving—that the blade was broad, and in most places twisted something like a screw. The soil is a heavy loam, which Mr. Jamieson says is better calculated for carrying superior crops, both as to quantity and quality, than of the other varieties.

Our lambs were handled last week, and proved to the satisfaction of the butcher. He marked one hundred that are to be removed to-morrow. I think Howard said that twenty score were sold, and that the remainder are to be weaned and *hogged*. They are going with their dams upon rich grass; and also received ruta baga till about the middle of April.

Elliot has got all the turnip land cross-ploughed, and is now employed at the summer-fallow. He has already run over some of the bean land with the scraper or Dutch horse-hoe, and has set apart eight horses, and the like number of men, for ploughing and cleaning the bean and turnip crops of this year. The best and steadiest hands are selected for this purpose, as it requires dexterity and attention. Of this husbandry, Mr. Jamieson has promised me a full description at a leisure hour. My *corps* have of late been much employed in scouring ditches and cleaning hedges, on which matters Mr. Jamieson bestows much attention. They are thinned a little by a draft of four to Elliot for his bean ploughs; and these were men who had been in habits of receiving similar employment in former seasons.

May 15. Hitherto I have said nothing about Mr. Jamieson's thrashing machine, therefore shall now communicate some particulars concerning that noble implement, imparted by my friend Fairbairn, to whom the sole direction and superintendence of it is entrusted. The machine is wrought generally by water, but has a six-horse impelling power also added, which prevents inconveniencee in the driest season; though, except in the summer months, and sometimes in autumn, a full supply of water is rarely wanting. The outer wheel is large, and placed on a gentle declivity, affording the impelling power its full weight, and throwing off the water cleverly, without hanging on or obstructing the velocity of the wheel by remaining in the tail dam. The barn or house in which the corn is thrashed is of great dimensions, being fifty feet in length, twenty-four in breadth, and twenty feet in height of side-walls above the lower floor, which gives a large stowage for thrashing corn and offal, till time is allowed for cleaning the whole by hand-fanners for the market. This is a convenience, I am told, too much neglected in all the original houses; and owing to the want of it, thrashing must often be given up, till the offal or *broke* is arranged and put in less bulk. I am informed that with wind machines, the want of barn room has been found a serious disadvantage, as often the impelling power is lost before matters can be put in order for using it. But to return from this digression. The drum of Mr. Jamieson's machine is three feet in diameter, five feet in length, armed with four scutchers or beaters, and moves with the velocity of 2400 feet per minute. To work this machine in a complete style, two men are required to feed the rollers; three girls or boys to open the sheaves, and hand them to the thrashing board; the same number of women to riddle the grain in the under apartment, and four men to remove and stack the straw. Generally a woman also is employed to clean the chaff-house and keep the offal in order. The corn is brought to the barn as wanted, by two one-horse carts closely boarded. These usually have full employment; and as a man is required to cast or take down the stack, altogether sixteen hands and two horses are employed; though, in point of fact, the wages of two men and three girls can only be charged against the machine, because the work of the others would have been equally called for, had the grain been thrashed in the old way by flails.

The saving to the owner, when such machines are employed, must, even in the first instance, be considerable; and, when the perfect way in which the grain is separated from the straw is taken into account, perhaps it may be equal to one-fifth or one-sixth of the gross produce. Fairbairn maintains that the saving is greatest upon wheat, which formerly, when hand flails were used, was with every attention seldom thrashed clean, especially in cold raw seasons. He adds, that one hundred bolls, or fifty quarters of wheat may be thrashed in a day of eight hours, unless the grain has been sloomed or mildewed; and that with oats a still greater quantity may be turned out. As the machine is provided with two pair of fanners, the grain is, in many cases, fit for market after being once riddled; but the usual custom is to run it again through hand fanners, Mr. Jamieson being very nice in the dressing of his grain that is to be marketed.

May 20. Yesterday and to day ten acres of the turnip break were sown with ruta baga or Swedish turnip for late spring food. The heaviest part of the break was selected for this purpose, Mr. Jamieson being of opinion, that a strong loam, if incumbent on a dry bottom, is better calculated for ruta baga than lighter soils. The ground, had got three ploughings, was harrowed, rolled and hand picked, till it was perfectly reduced, and free of root weeds, when it was formed into drills with 27-inch intervals by a bout of the plough. Into the interval of these drills plenty of dung was deposited, (Mr. Jamieson says that ruta baga requires almost double the quantity of dung that is sufficient for common turnips); after which the drills were split, and the dung completely covered, when the seed-barrow was run upon the top, which finished the operation.

Mr. Jamieson mentioned two particulars which deserve attention when ruta baga is sown. *1st*, That, in forming drills, the plough ought to go deeper than when common turnips are intended, so as a proper bed may be made for the extra quantity of dung given, otherwise it will not be sufficiently covered. *2dly*, That early sowing is advantageous, so as the root may have time to arrive at maturity. He added, that ruta baga is a dull growing plant, making slow progress in its passage; and that, if the field yellow turnip maintain its character, he is not sure but he will abandon the culture of ruta baga altogether.

The remainder of the break intended for turnips (90 acres) is in a forward state of preparation, and is now harrowed down so procure the vegetation of annual weeds. The plain summer-fallow break is cross-ploughed, and receiving the full advantage of the present dry weather. I presume it will lie in this state till the seed is over; through Elliot says, if a shower comes soon, he will give it a trimming with his harrows, so as the root weeds may be loosened, and the growth of annuals forwarded. My squad, now reduced to six men, are turning dunghills from morning to night, except when detached for incidental *purposes*.

May 27. Mr. Jamieson has just furnished me with a circumstantial detail of his bean husbandry; some particulars of which must be interesting to you. According to his mode of cropping, this plant generally follows oats after grass, when the land may be supposed to be in good condition. He first begins by giving it a cross furrow, which is taken as deep as the soil will allow. The field is then completely water-furrowed; the end furrows and *gaw*-furrows being digged with the spade, in which situation it is left for the winter. The moment that the ground can be worked in the spring he harrows it according to circumstances, but never breaks down too much at once, in case a change of weather should ensue. The ploughs are then entered, and one drill-barrow allotted to every three ploughs. By taking a nine-inch furrow, and running the barrow after the third plough, an interval betwixt the rows of 27 inches is left; and such an interval he thinks fully adequate for admitting horse-hoes of every description. About fourteen days after sowing, the ground is harrowed and water-furrowed; and in this state it remains till the young plants are fairly above the surface, when the Dutch hoe or scraper is employed, as formerly mentioned.

This is the mode of planting beans hitherto exercised by Mr. Jamieson, but he has it in contemplation to change it in an essential branch, which, in favorable seasons, must undoubtedly be beneficial. Instead of sowing with the first spring-furrow, which, being taken ebb, does little more than cover the seed, he means to give the ground a second deep ploughing in a contrary direction to the first one, afterwards to harrow it, and then to form drills of the same wideness, either by a single furrow or a bout of the plough. In the intervals of these furrows he will run the barrow, after which the drills will be slit out as in the turnip husbandry, and the seed covered. At a suitable time afterwards, the harrows will be drawn across, and the ground levelled, preparatory to the cleaning process,

It occurred to me, that the time consumed in slitting out the drills may be saved, were the harrow drove across when the beans are sown; but Mr. Jamieson obviated this remark, by saying, that a flush of annuals was to be dreaded in such a case; whereas, by delaying the harrowing two or three weeks, the first crop of weeds would in a great measure be thereby destroyed. The only objection which remains to the plan is, that in some seasons seed-work may be so long delayed as to prove injurious to the crop. In every other respect, the proposed change must be attended with important advantages.

We have had a few changes of servants at this term, chiefly with those not reckoned the best hands, or with whom Mr. Jamieson was dissatisfied. Indeed, it would appear that he possesses such happy knack of managing his people with judgment and dexterity, and at the same time pays them so handsomely, that servants worth the keeping rarely leave him. It is a mark of a good farmer, to regulate his different operations according to the nature of the soil in his possession; and in like manner, a man of prudence and sagacity will at all times govern and direct those below him, according to their different tempers and capacities.

June 3. The portion of land intended for yellow turnips is now seeded; and the several processes were precisely similar to those already described when the ruta baga was sown, only that a smaller quantity of dung was given. Elliot informs me, that this variety has been cultivated here for two years past, and that it stands the frost nearly as well as ruta baga. He added, that it is not so shy of growing, and may be obtained on soils where the other would not live. About five acres of horse potatoes, or yams, were also planted, chiefly for swine food, or as a supply to the cattle when turnips are wanting. This may sometimes happen in a stormy day; and Mr. Jamieson takes care to be provided at all hands, so as his bestial may not suffer.

At Mr. Jamieson's desire, I accompanied Elliot a few days ago through the bean fields. They have all been once run over with the Dutch hoe, and now the small turnip ploughs are employed to lay away the earth from the sides of the plants, and to form a fresh ridge in the centre of the interval, which will afterwards be separated and divided by a second application of the Dutch hoe. The whole formed a pleasant sight, being in superior order to the most of garden culture. The oat-fields are looking well; indeed every thing on the farm has a most thriving appearance.

Last week the horses were put upon green food, and two feeds of oats per day, which I learn is the practice here, till the turnip sowing is over, when they are limited to one feed. One of my men is employed to cut the grass, and another ties it up in bunches of 28 lbs. avoidupois weight, four of which are given to each horse per day. Twenty cattle that got ruta baga in April and May, are also carried on with clover given them at the stake, and they seem to be thriving well. It takes a man and two horses to bring home the grass, as the field is about half a mile from the homestead. The feeding of the cattle is in Howard's department; but the charge of superintending the cutting and tying the grass is with me. I often take the scythe by way of amusement, though it is rather heavy work for one of my age. Mr Jamieson is very pointed in having the grass cut equally and close by the ground, and says, the lower it is cut at this time, so much the faster and stronger will the second crop grow afterwards.

June 10. All hands are employed about the turnip-seed work, and what with ploughs, harrows, rollers, drills and carts, and the fillers and spreaders of dung, a jovial number is upon the field; but I must describe things in order, otherwise you will not comprehend the nature of our operations sufficiently.

The extent of the field remaining for common turnip is seventy-five acres or thereby. It had been ploughed four times over, and after each furrow immediately harrowed and rolled, so as moisture might be retained. Some parts, which were rather rough and cloddy, required a repetition of these operations; and this was performed by four harrows and one roller, drawn by two horses. This left thirty-eight horses for ploughing, carting and sowing; and these were arranged in the following order.

First, Eight ploughs and sixteen horses for forming and reversing the drills, so as the dung might be covered. 2*nd*, Six carts and twelve horses to drive out the dung, which was middened as carried out in winter, adjoining to the field. 3*d*, Two drills, each drawn by one horse, and sowing two rows at a time. This was the nearest division of the strength that could be made, and hitherto matters have proceeded with regularity. Elliot looks after the ploughs and drills; Fairbairn the spreaders; and the loading of the carts is under my superintendence.

It is a principal object with Mr. Jamieson to have the drill formed, dunged, slit out and sown, as rapidly as possible, so as moisture, the soul of vegetation, may be preserved, upon which he says every thing depends; of course, these operations follow each other in the quickest manner. How soon that five drills were formed, which was done by a bout of a plough to each, the carts entered; and the dung being laid in small heaps, was instantly separated by ten spreaders, who were divided into two gangs under the immediate direction of Fairbairn. Four of the ploughs were then set to work in splitting out the drills, and were followed by the seed-barrows, while the other four ploughs proceeded in forming or making up fresh drills. The carts rather pressed upon the ploughs,—though, by going at a long step, no obstruction occurred. Indeed, Mr. Jamieson had, with his usual attention, selected the strongest horses and most active ploughmen for this department of the work. The carts were also divided into two heads, each having two of my squad to fill; the remainder were lent to Fairbairn, who had his corps of spreaders made up with some of Howard's people; a steady man was appointed for drawing out the dung to each head of carts, which Mr. Jamieson considers to be necessary, if you wish the land equally dunged. Altogether, there were in the field 35 men, besides Elliot, Fairbairn, and me. I might have included Mr. Jamieson, who did not leave us for an instant, but rode about the field from the beginning of each yoking to its conclusion, except when at breakfast. Elliot thinks that seven acres were finished this day; and as the carts took out 112 loads, which was 17 to each cart, or 14 to the acre, I apprehend he is not far out in his calculation.

June 24. Turnip seed is now over, having from first to last been favored with excellent weather. The first sown drills, though the weather has been dry, fairly above ground,—entirely owing, as Mr. Jamieson declares, to the sedulous attention bestowed on securing the means of vegetation. As the several operations went on from first to last in an uniform train, I hope the whole will be equally successful, as the different departments of the work were nicely balanced. The seed used is all of the globe kind, raised on the farm, as Mr. Jamieson says he will never trust a seedsman for a supply, unless impelled by the most urgent necessity. The ruta baga and yellow turnip were likewise of his own produce; and with what he saved of these seeds many of his neighbors have also been supplied.

Fairbairn, with a large detachment of women and boys, is at this time going through the bean fields, pulling out every weed from the drills to which the plough had not access. The ruta baga is thinned and set out, and the yellow turnip follows. Fairbairn has about fifty hands, young and old, under him; and it is wonderful to see with what adroitness many of the boys *pull* and *shoot* the hoe, and how dexterously they set out the young plants. The hay harvest is also commenced; and six of my fellows are cutting away this day, and will continue, if the weather proves dry, till forty acres are laid on their back. Mr. Jamieson has enjoined me, in the most positive manner, not to allow a scythe to be drawn when the grass is wet, alleging that such a step would prove injurious to the quality of the hay. In the event of wetness, he has directed me to make the cutters turn an earth midden at the end of the grass field, to which lime shells were lately driven, so I cannot be at any loss, however the weather should turn out.

Elliot is giving the summer fallow break a third furrow, and driving lime shells to it. He first harrows the land, after being gathered up, and draws out the lime in heaps of a barley firlot, or a bushel and a half each. The ridges being 18 feet in breadth, have cross furrows drawn at the like distance, which makes them appear like a dam-board; and as a heap is drawn out into each square, any mistake in the application must be very trifling. Six carts are now employed at the lime, eight ploughs at ridging up the land, and eight horses at the beans, which are now receiving their last furrows; and, when finished, the horse-hoes go to the ruta baga and turnips. A cart continues to drive grass constantly; but the horses therein employed are a couple of odd ones, not included in the regular strength. Notwithstanding the immense number of hands employed, I assure you that there is work at this time for more, if they could be procured; but this being the busy season with every farmer, a temporary supply is not to be obtained.

July 8. The hay field is all cut, at least that part originally intended for dry food, though Mr. Jamieson says that probably a few acres more may be used in the same way, if not needed for the horses and cattle at the stake. This however, will not be determined on till the end of the month, by which time the tare-field will be ready for cutting. Fairbairn had the charge of winning and cocking the hay. As the weather proved good, the processes were not difficult. It lay one day untouched after being cut; then was turned over: and in the afternoon of the same day, put up in small hand-cocks, four or five of which were afterwards put into a fork rick; and in this state the hay remains till fit for the stack-yard. The turnip field is at hand; so Fairbairn's squad wrought there in the mornings and at spare times, and was ready for hay work when called for. My men, not at the turnip ploughs and grass cutting, are attached to him so long as hay harvest lasts; and, of course, I am also under his direction.

The fallow break is now wholly ridged up, and about one third of it limed. I understand that one half of the break was limed at last fallow time; so the part that remains will soon be finished. The lime is to be spread the moment the hay is ricked, which is to be done by my people, not otherwise engaged, and some of Howard's men; of course, the superintendence will fall upon me. Mr. Jamieson says that he means to plough the lime into the ground with a shallow furrow, then to harrow and lay on the dung, and to conclude the process with a seed-furrow about the beginning of autumn.

It gives me pleasure to add, that Mr. Jamieson sent for me last night after working hours, and inquired concerning your welfare. After some other conversation, he kindly said, 'George when you write my good old friend your father, tell him that I am well satisfied with your behavior since you came under my management, and that I will do every thing in my power to serve you. Be assured, however, that success, in a great measure, depends upon yourself. If you remain steady, *diligent* and industrious, there need be small fears entertained; but should sloth, carelessness or irregularity prove master, the issue may easily be foretold. You have hitherto shown an anxious disposition to learn, and given proofs of your activity, Persevere then in those honest endeavors, avoiding idleness as the parent of vice, and vice as the source whence every human misery flows.'

(To be continued.)

ADVANTAGES OF THE THREE-SHIFT ROTATION. IMPROVEMENT IN WESTMORELAND.

To the Editor of the Farmers' Register.

The republication of my essay on ***marine manures*** in your 'Country Advertiser,' being likely to give additional currency to an erroneous opinion, therein expressed, in regard to the four-shift rotation, I deem it my duty to correct it, lest some inexperienced farmer misled by my authority may be induced to adopt a system, which subsequent experience will compel him to abandon. The late Mr. John Wickham was the first I believe to make known the fact which ought to have been obvious to every one—that the four-field rotation of lower James River, is a much more exhausting course than the much abused three-field system common throughout the tide-water region of Virginia. Certain it is, that none but the richest soils, such as those of Shirley and Westover, on which the successful experiments of Messrs. Carter and Selden were made, can bear three grain crops in four years, without frequent and liberal supplies of enriching manures. I very soon discovered, after the publication of my essay, that the comparative poverty of our soils, (if there were no other objection to the system,) would preclude the profitable cultivation of our farms, or the four-field rotation of corn, wheat, clover, wheat, which I at that time intended to adopt. The less exhausting, but much less profitable four-field system of corn, wheat, clover, clover, has been adopted by some persons in this neighborhood. But to that, there are such obvious and weighty objections, (of which I shall mention but two,) that it must soon be abandoned. 1st. Corn is the great staple of eastern Virginia. It is the most certain and by far the most profitable crop; and as a general rule, the greatest profit cannot be realized with less than one-third of the arable land in corn. 2nd. The tide water farms are so prone to put up bushes of gum, locust, persimmon, &c. that to cleanse them for a crop, after they have been two years out of cultivation, requires so great an expenditure of labor, as to interfere seriously with the essential operations of manuring and draining, on which depend, almost exclusively the profits of agriculture.

I am now thoroughly satisfied, from my own experience and extensive observation, that the three-field system, of corn, wheat, or oats, and clover, properly pursued, is by far the most profitable course of farming in eastern Virginia. To make the system effective, there must be a standing pasture of marsh or wood-land, sufficient to sustain the farm stock until the month of June, when the clover is in full bloom. At this time the stock may be turned in, with the full assurance that you will have an abundant dairy, a full meat house, and a fine crop of corn succeeding the clover. The fields should be well and separately inclosed, and the hogs after harvest permitted to glean the wheat field, which should be studiously guarded from the encroachment of all other stock. By this means a full supply of fine pork for the use of the family and laborers, may be secured at a very trifling expense.

Manure is the basis of this, as of every other system of successful husbandry. The field for corn should be thoroughly manured. If this cannot be entirely accomplished, it may at least be very nearly effected on tide water, where *marine manures* are inexhaustible. On farms farther removed from the water, where these manures are not to be procured, substitutes may be found in marl, leaves from the woods, and a compost of lime, leaves, earth, &c. which may be made in great quantity by having a permanent cow-pen liberally supplied with earth, lime and leaves, throughout the summer. I have for several years made this compost in considerable quantity, and used it with great effect, on the forest farm on which I reside. Several of my neighbors also have pursued the same course with very decided success.

There is no portion of the state, known to me, in which agricultural improvement has advanced so rapidly, as it has done in this immediate neighborhood, within the last ten years. In that period the crops it is believed, have been at least doubled, the value of lands greatly increased, and the wealth and comforts of the people vastly augmented. These inestimable benefits may be justly attributed to the enlightened zeal that now animates our farmers, and to the liberal and judicious application of manures common to the whole tide water region, and within the reach of all who have the industry to apply them. But those improvements, great as they are, I am well convinced are yet in their infancy; and the most sanguine cannot now foretell the glorious results that must ensue, from the continued and persevering application of the various resources, with which a wise and bountiful providence has so abundantly blessed us. WILLOUGHBY NEWTON.

Westmoreland, Va., Aug. 29th, 1839.

PRACTICAL TREATMENT OF BEES.

From the Edinburgh Encyclopædia.

We have thus traced the natural history of the honey bee from its origin until attaining perfection, and shown how the various species form one great colony, where labors are carried on for the common good. We have explained also, that, at a certain season, bees desert their habitation in quest of another, which, in a domesticated state, the cultivator is careful to provide; and we shall now proceed to the practical treatment of bees, and point out how their labors are to be converted to utility, profit, and pleasure.

All the circumstances above related having taken place, the new swarm is lodged in a hive, there to commence the collection of honey, the fabrication of wax, and the perpetuation of the species. Much has been said of the fittest size and figure of a hive, and of the substance of which it should consist: wood, straw, and oziers, have all been recommended; and round, square, oblong, and hexagonal hives have had their particular partisans. These things, we apprehend, do not merit the importance bestowed upon them; and our reason for saying so is, from having seen the most ample products of honey, under conditions almost diametrically opposite. At one time we have seen large straw hives, of the ordinary fashion in this country, full to the brim of rich honey-comb; at other times we have seen them almost empty, without any sensible cause, and where circumstances seemed to favor the reverse. We are thence induced to conclude, that less depends on the shape and capacity of the hive, than on the kind and quantity of the swarm introduced into it, and on the season in which their collections are made. Examples have come under our notice, where a swarm, lodging in the roof of a house, has produced a great quantity of honey in combs only four or five inches broad: another swarm also in the roof of a house we have known to fill combs above eighteen inches in breadth. Exposure to the north or south has not affected the bees: their provision has been equally abundant. And here we may remark, that in all instances that have fallen within the sphere of our observation, the products of swarms, lodged in the roofs of houses, have invariably been abundant. We do not pretend to account for this. Perhaps it may partly result from their labors being performed without any disturbance or interruption; partly from the greater heat preserved in a roof during summer. Heat is the soul of insects: their action and exertion are directly in proportion to the temperature of the atmosphere; and cold is the bane of their existence. It is not unlikely, also, that the same cause promoting the hatching of the brood, contributes to render the colony more numerous: and if their swarming is at all dependant on want of room, large portions of them have not an equal inducement to seek another dwelling. Pallas tells us, that the Russian peasants, in remote parts of the empire, hollow out a part of the trunks of trees, 25 or 30 feet from the surface of the earth, for the purpose of hives, and coverthe opening with planks, leaving small apertures for the bees. At Cazan, Mr. Bell saw hives of a similar form, which the inhabitants bound to the trees at the side of a wood, in order to secure them from the bears.

As abundant collections of honey are often made in the common straw hives, we cannot affirm that they are unsuitable for the purpose; but they are attended with the disadvantage of preventing the owner from an early appropriation of the labor of the bees. One convenience, indeed, lies in the facility of construction, which always merits due appreciation in every branch of rural economy; and, also, that the cost is inconsiderable. Though neither the size nor figure of the hive be important, all modern cultivators seem agreed that it should be susceptible of additions. In the ordinary straw hive, the addition is made by raising it on a circular ring or hoop, either of wood or of the same materials; a clumsy and awkward expedient, which commonly leads the bees to waste much of their labor in filling up crevices. Notwithstanding this, it is adopted in Brittany with some little difference, and there called the *Scotch hive*. The hive itself consists of two pieces, each twelve inches wide, and eleven high, made of rolls of straw. The under one is divided from the other; but a communication hole, fifteen or eighteen lines in diameter, is left for the bees. As they work downwards, the under part, which is nothing but one of our common *eeks*, or broad hoops, is next filled. Pyramidal hives have been made several feet in height, and divided into different stages, or compartments; which the bees, after being lodged in the highest, would successively fill on removal of the floors or stages. Boxes of convenient size and form, placed above each other, have likewise been recommended, and which we should suppose well adapted for enabling the cultivator, at all times, to take the honey with ease. Such boxes are made of well seasoned wood, nine inches long, the same in breadth, and eight inches high; but from what we have said, there is no necessity for a rigid adherence to these dimensions. In the roof there is a communication hole three inches square, on which is placed another box of similar structure; others may be raised above this to an indefinite height; and the bottom of each is open like the mouth of a common hive. When a swarm is lodged in a box, if only two be used, it is immediately to be put over an empty one, as the bees must have more room; and if more than two are used, a new one is successively to be supplied below. The bees, beginning from above, will soon fill the upper box with honey; and it is to be then separated from that beneath it, by drawing through a long thin pliable knife, to cut the comb. The communication hole of the lower box must then be covered with a board, and the box separated carried to a distance, where the bees remaining in it may be dislodged, by turning it up and rapping on its sides with a small stick. The proper time to perform this operation is at sunrise. Collateral boxes have also been suggested, from the belief of their being attended with greater advantages to the bees. The size is nearly the same with that above mentioned. There is a communication hole in the side, and an opening low and wide below in the sides applied to each other, to allow the bees more ready passage. Collateral hoops of twisted straw or wood were long ago invented, by which means the inventor enlarged his hives to an unlimited extent; and these he kept, with great advantage, in a garret near the roof of his house. Madame Vicat invented a kind of hive, composed of hollow frames of three sides, which are connected together, and can be separately taken out at pleasure. Each frame is made of three pieces of plank, half an inch thick. The two side pieces are eleven inches high, and five and a half broad; the piece connecting them above is seven inches long, and they are ten inches asunder at the bottom. The sides of these open frames are applied to each other, and if one of the four be taken away, an empty one can be introduced, or the remaining ones can be closed together. Somewhat analogous to this is the *leaf* or *book hive*, invented by M. Huber, some of which construction have recently been adopted in Scotland, after the description he gives of it. This consists of twelve hollow frames, twelve inches high, nine or ten in breadth, and fifteen lines in width, as it is intended each shall receive only a single comb. These twelve frames, laterally applied to each other, form the whole hive. All are connected by means of hinges at the back, so that they divide asunder in opening like turning over the leaves of a book. The ten intermediate frames, between the first and twelfth, are hollow; the outside of these two are covered; in them, also, is an entrance for the bees; there should be one in all the rest, to open at pleasure. On first lodging a swarm in one of these hives, a small piece of comb should be fixed in a division, to guide the direction of those built by the bees, which will be parallel to it; and as each frame contains but a single comb, it is extremely well adapted for observation, and it also admits the removal of that comb without affecting or deranging the rest. The whole contents are exposed to view, the queen is easily found, and whatever should be removed or altered can be selected with great convenience. The inventor conceives, that the book hive has the property of rendering the bees more tractable; for on opening any of the divisions, the bees rather testify fear than anger, by retiring into the cells as if to conceal themselves. This he ascribes to the effect which the sudden introduction of light has on them; for they are less tractable after sun-set and during night than through the day. The divisions must be separated slowly, and care observed to avoid wounding the bees. If they cluster too much on the combs, they must be brushed off with a feather, and breathing on them cautiously guarded against. The air which we expire seems to excite their fury; and it certainly possesses some irritating quality, for if bellows be used, the bees are more disposed to escape than to sting. Another advantage attends the leaf hive, which consists in the power of the operator to make the bees work in wax, or, which is the same thing, to construct new combs. All that is here required is to separate those already built so far asunder as to leave an interval in which additional ones may be constructed. Suppose that a swarm be lodged in a leaf hive consisting of six divisions, each containing a comb. If the young queen be as fertile as she ought, the bees will be very active in their labors, and disposed to make great collections in wax. To induce them towards it, an empty frame, or division, should be placed between two others, each containing a comb. From the necessity which nature has imposed on these insects of never leaving more than four lines between their combs, they will soon begin to build a new one in the empty space, which will be parallel to the others. The number of vacancies left may be proportioned to the strength of the swarm, and the goodness of the season; but they should not be forced too much to work in wax. M. Feburier, the most recent observer on this subject, and who, we believe, is just about to publish a work regarding it in Paris, has recommended a hive to the National Institute of a quadrangular pyramidal figure, with moveable sides. Its principles are said to be founded on those of M. Schirach and Huber; but, as yet, they are not sufficiently detailed to enable us to to explain them. If wood be used, it must be extremely well seasoned, and perhaps covered with some thin varnish on the outside, else it is apt to decay. Sir Torbern Bergman ascribes the scarcity of bees in Sweden principally to employing wooden hives.

Those who are anxious to view the various and progressive operations of bees, may gratify themselves, by procuring hives with glass sides. This can hardly be denominated a modern invention, as Pliny records, that a Roman senator had something of the same kind, made of the thinnest and most transparent horn. But those entirely made of glass were not known on the continent before the year 1680, though they were made with panes in England early in the same century; and hives made completely of glass are spoken of in 1655. Glass hives ought not to be round, like the common shape, as the bees are concealed among the combs; they should be square boxes, whose sides consist of four panes. Reaumur used them so thin as to admit of no more than two combs being constructed, that he might the better witness the procedure of the inhabitants. A pane on each side of Huber's hollow frames exposes both sides of the comb. Such hives must be covered with a wooden box, or an opaque substance, as light disturbs the operations of bees.

Some authors think that there is greater hazard in giving bees too much than too little room to work, when first lodged in a hive, as their animal heat will not be sufficiently confined. However this may be, they ought afterwards to enjoy enough of space; for we are satisfied that many swarms are injured from wanting it.

Nothing is of greater importance than the size of the swarm lodged in a hive. We repeatedly see large swarms succeed, while small ones, especially towards the end of the season, fail. The bees, therefore, in each swarm should be extremely numerous; and we may confidently affirm, that the cultivator will find much of his success depend on the number of workers contained in a single hive. It appears, that bees are discouraged by the smallness of their own numbers; that, when greatly reduced, their instinct is affected, they labor with less activity, they cease to keep guard at the entrance of their hive, and testify more indifference for their own fate and that of their young. Whether the advantage lies in a numerous swarm making greater collections in a shorter time; in augmenting the temperature of the hive; or in the different internal functions having larger classes of workers to perform them, we shall not attempt to decide. We therefore recommend the junction of two or more swarms into one, particularly when the period of collection draws towards a close, and the sacrifice of their supernumerary queens. By this expedient it will be seen, that while each could hardly subsist itself, and lay up provision for winter, they will be enabled to survive during its most rigorous cold; and, if the operation be performed earlier in summer, they will gather ample stores. Practical directions have been given for the exact weight which a good swarm should amount to. Bonner says, a swarm is very good if it weigh four pounds; and Butler maintains, that "the goodness or greatness of a swarm you may most certainly know by the weight: it being a good one that weigheth five pounds; a reasonable good one that weigheth four; and a very good one that weigheth six." But the number of bees in a pound is very far from being ascertained, which must restrain us from pronouncing on the exact weight that should constitute a good swarm. Thorley, whose work on bees participates of many of those absurdities in which most authors on this subject have allowed themselves to indulge, observes, "In October 1743, when putting the bees of a small late swarm into an empty hive, and afterwards upon a table, I took a particular account of their measure, weight, and number: in measure a quart; in weight one pound and a quarter; in number two thousand." And he concludes, that the number of bees in a swarm weighing four or five pounds would be 8000, or upwards; whence a suitable hive for 8000 or 10,000 bees should be equivalent to two pecks and a half, or three pecks, in capacity. The calculations of M. de Reaumur produce a very different result. A very fine swarm which left one of his hives he estimated to consist of 43,000 bees, and weighed eight pounds. Thus there are, according to him, 5376 in a pound of 16 ounces; and Butler, who, in spite of all the extravagancies of his work, certainly made some accurate observations, estimates the number of bees in a pound at four thousand four hundred and fifty. We suspect, that both he and Reaumur have overrated the number.

The situation and arrangement of the apiary, claim the cultivator's attention. Each hive should stand on a wooden sole, or rest, supported on a single wooden post driven into the ground, or on three close together, near the centre of the board, that the enemies of the colony may have difficulty in crawling up from below. It should be fixed securely, so as to escape being overturned by the wind; but the common custom of laying a turf on the top must be avoided, on account of the harbor it affords to noxious insects. Hives should stand far apart; if there are six hives in one portion or division of the apiary, they should not be less than nine or twelve feet asunder. But too great a number never should be situated in the same district. The collections of bees are drawn solely from flowers, and perhaps, in some small measure, from honey dew, which at times appears on leaves, and is said to produce an inferior honey; it is therefore evident, that immense quantities of bees, actively employed, would not be long in exhausting the whole. The number of hives should, therefore, be regulated by the situation of the apiary. A district abounding with flowers and blossoms will admit of more than one where the chief product is grain. An apiary ought to stand in a quiet sheltered place, where the bees may perform their labors totally undisturbed: flowers, particularly those most fruitful in honey, should be copiously disseminated around; and, for the facility of saving swarms, it is better to have low flowering shrubs in the vicinity than lofty trees. Means should be practised to obtain a succession of flowers in successive seasons, that the bees may always have the collection of honey in their power, and without going to a distance. It is not known how far they fly; some think they traverse several miles; others, that their flight hardly exceeds half a league; but the accidents to which they are exposed render it important for provisions to be near at hand. In the low country, mignonette is said to afford the finest honey, and may be kept in blossom a large portion of the year. Bromwich, an intelligent writer, relates, that, in 1779, he planted a great quantity of it before two bee hives, at a considerable distance from any other bees. With such abundant supplies as this afforded them, few ever left his garden. In September he took the honey, and found it exceeded, by above a third, what he obtained from any other two of his best hives, where the bees were obliged to fly farther; and equal in fragrance and color to what is imported from the warmer climates. It is a favorite flower among bees; for we have observed patches of it, in the very centre of the city of Edinburgh, resorted to from hives beyond the suburbs. Bonner affirms, that he has often "seen a hive, by being placed nigh heath, become ten, twelve, or fifteen pounds heavier in the month of August; whereas, if it had remained in its original early situation, it would probably have become every day lighter after Lammas."

This circumstance leads us to another point which the cultivator has to observe, namely, changing the situation of his apiary as the flowers surrounding it decrease. Those in one district, as we well know, have entirely faded, while those of another are in full blow. Though the practice of transporting hives to fresh pasturage is not so general as it ought to be, probably because they are seldom numerous in the possession of individuals, it is not unknown in Scotland; and persons in the vicinity of Edinburgh yearly send their whole stock to the Highlands, for the purpose of gathering honey. In France it is done either by land or water. M. Reaumur mentions the custom of a M. Protaut, who cultivated bees on an extensive scale, and seems to have kept between 500 and 600 hives for a manufactory of wax. These he sent twenty miles from their ordinary station, and, if the place appropriated for them was not productive of food, they were transported still farther. Each hive was put on a coarse cloth, the corners and edges of which were turned up, and secured by binding them round with packthread. Those containing small quantities of comb were kept in the usual position; but those full of comb were reversed, in order to secure the comb. They were then disposed in tiers, two and two, throughout the whole length of carts made on purpose, from 30 to 48 being carried in each cart. The carts travelled slowly over the smoothest road when the journey was long: if the hives were slenderly stored, they sometimes halted near fertile fields, and the bees were allowed to go abroad to feed; having returned at night to their dwelling, the journey was resumed. The Egyptians also transport their bees on a large scale on the river Nile. The inhabitants of lower Egypt collect the hives belonging to different villages, and pile them up in pyramids in boats prepared to receive them. These boats slowly ascend the river, as in higher Egypt the flowers are earlier in bloom; and they stop on the way, to allow the bees to fly about and make ample collections on the banks. Three months are occupied in the voyage and return, when each hive is delivered to its proprietor, whose name, mark, or number has been affixed to it. The modern Greeks, inhabiting the coast of Asia Minor, convey their hives also in boats from shore to shore, in order to reach newer and more abundant pasturages than what they leave. In one of these voyages we are told, that a hive being accidentally overturned, the enraged bees so keenly attacked the seamen, that they were glad to leap overboard and swim to the shore, which fortunately was not distant. The extent of this practice justifies our recommending it as one effectual method of increasing the quantities of honey. The hives must be transported on a spring cart, which, if well hung, an essential quality, ought to travel expeditiously through the night; and they should also be kept cool. Small holes, for the admission of fresh air, should be made in the bottom and sides of the hive; but the operator need not dread the consequence of keeping his bees one or two days in total confinement. In changing the situation of the apiary, certain conveniences must be sacrificed; but when it remains stationary, its proper position is in a field or garden, where it is sheltered from the winds, and protected from the access of cattle and the curiosity of mankind, by a railing. Flowers and shrubs ought to be in the immediate vicinity, and trees at a distance. It should not be encompassed by high walls, for the bees, from either being heavily laden, or fatigued with their labors, or affected by the sudden chill of evening, predominant in our own climates, are unable to surmount it: and there are the same reasons against its being encircled by a thicket. A southern exposure is not indispensible, as Bergman properly observes; but hives should seldom stand in the shade. The apiary should be freed of weeds and tufts of grass close to the hive, as they harbor vermin: and spreading sand or gravel around the hives, is beneficial both in obstructing the growth of weeds, and in absorbing moisture. To save the trouble of attendance, it is convenient to have the apiary in the vicinity of a dwelling house.

After the site of the apiary is chosen, it is necessary for the cultivator frequently to inspect his hives, to ascertain whether they are in a flourish-ng state, or suffer from disease and the inroads of nemies. Bees, in common with other animals, re liable to various diseases. The Abbé della Rocca informs us, that almost the whole hives in he isle of Syra, in the Archipelago, were detroyed by an epidemic disease which prevailed rom 1777 to 1780. In this case, some vice or coruption seemed to originate among the young rood, which, infecting the bees, produced their eath. A kind of dysentery of diarrhœa attacks ees at certain seasons, which is extremely injurious; the commencement is seen by the foulness f the combs, which must be pared, and the tainted ortion taken away. Some cultivators pretend to ure this disease, which, they assert, arises from he nature of the honey collected, by supplying he bees with rosemary and honey diluted with water: others recommend a syrup, prepared with qual quantities of sugar and wine and a little nutmeg, a singular remedy: and a third class coneive a mixture of two pounds of clarified honey nd as much sugar, with a pound of white wine, eneficial. Bees are likewise subject to a disease f the antennæ, which, though not dangerous, renders them dull and languid. It appears by iscoloration like moulding, and is said to be curable by the preceding preparation. Toads, frogs, and mice, are reputed great enemies to bees: but we doubt whether it be truly so with regard to the wo former, in this country at least; and the ravages of the latter are certainly not general. Perhaps, while the bees cluster together in rigorous winters, they may penetrate the hive and devour he combs; at other times it would be too dangerous an attempt even for animals better protected. Birds of several species, particularly swallows, sparrows, and red-breasts, are also ranked among he enemies of these insects: with respect to which, likewise, we should wish to see the facts better ascertained before giving them credit. Spiders and snails, which are considered noxious, can do little harm; for in this island there are very ew, if any, of the former capable of contending with a bee, and the only damage done by the later is soiling the hive. More dangerous are the arvæ of a small moth, hatching from eggs deposied within the hive, as they are destructive of the comb, and likewise the *sphynx atropos* in its perfect state; but most formidable of all are wasps and hornets, and plunderers of their own species. The first two being strong and vivacious animals, are able to destroy living bees, and suck the honey from the abdomen; or they may penetrate the hive, and consume the comb. When a wasp tries o enter, it is resisted, but having made good its way, we believe it is then little regarded, and may eisurely satiate itself with honey. The nests of wasps ought to be carefully traced out and destroyed; if in the earth, by pouring boiling water down their hole, or kindling a quantity of straw where they are less accessible. Observers confidently affirm, that a whole swarm of bees, from defect of food and other causes, sometimes interrupt their natural collection, and becoming a band of plunderers, rob the stores of their neighbors. In this case, which will appear from the contests perpetually taking place on the boards and about the entrances of other hives, it is necessary to ascertain whence the depredators come, whether from neighboring hives or from those at a distance. If their plundering seems to arise from want of food, as those scanty provisioned are more apt to follow this method of supplying themselves, they must be fed at night when the sun is down, and while all the bees have returned. It is reported not to be an uncommon incident for a swarm to abandon their own hive, and take possesion of another to relieve their necessities. Bees, on losing the queen, having no interest to prosecute their labors, if brood be wanting in their combs, sometimes begin to pillage the hives in the neighborhood. The obvious remedy is here to provide them with a queen, whereby all their faculties being aroused, they will be reclaimed to their usual nature. Schirach warns us, on removing comb from a hive, to beware of scattering or dropping it, and to replace the hive exactly in the same position as before, otherwise the inhabitants of stronger colonies will obtain more ready access to attack the honey in the combs, or to collect what has fallen from them. The weakness of a hive is one great inducement for its neighbors to pillage; and as cleanliness, and being kept free of vermin, preserve the vigor and activity of its inmates, due attention to them should not be neglected. Removing the hive which is the object of plunder, and covering it with branches, has been recommended; and such an expedient will certainly present a good chance of escape.

But all the devices adopted by us are poor and insignificant, when compared with those resorted to by the bees themselves to provide against danger. Here we have an opportunity of admiring that wonderful instinct, which animals, standing so low in the scale of creation, exhibit. Even supposing them to possess nothing analogous to reason; that the regard for their queen, and the watchful care of their young, result from some pleasurable sensation; that the massacre of the drones originates from some sudden principle of aversion; we cannot refer their precautions to avoid danger to any relative source. It is evident that they labor in concert; that their operations tend to one general object; and that they are aware of it being fulfilled. Surely all this cannot be done without some mode of communication with each other: but considering that every thing they perform is in the dark; nay, that the perfection of their work is partly proportioned to the privation of light; the difficulty of conceiving how they can know each other's proceedings is greatly increased. It has been warmly contested, whether bees are capable of imparting what we should call thought in beings higher in the chain of animated existence, and especially, whether there be any thing resembling voice among them? We have already remarked, that the workers can retain young queens in their cells after attaining complete maturity, which they are capable of doing by strengthening the seal or covering with additional wax; and that they regularly liberate the oldest of those of different ages. A sound, which we cannot compare to the buzzing of insects, by the balancers beating on their wings, is heard from the young queens. No researches, however, have yet detected the organ, if it is an external one, from which the sound proceeds. When a queen is hatched, she seeks the cells of those that will become her rivals, and uses every possible exertion to destroy them; but the workers, to which other queens, even in their imperfect state, are precious, generally present the most decided opposition, and render her attempts abortive. Yet, from the property which the queen possesses of emitting that certain sound before heard from her cell, their resistance becomes vain; it paralyzes all their faculties; and she proceeds to operate destruction. The following observations, by a distinguished naturalist, on this head, lead to an illustration of the peculiarities among bees when exposed to danger, though they more immediately relate to another branch of our subject. "The first of a number of cells containing females, opened on the ninth of June, and a young queen, lively, slender, and of a brown color, escaped from it. Now we understand why bees retain the females captive in their cells so long after the period of transformation elapsed; it is that they may be able to fly the instant of being hatched. The new queen occupied all our attention. When she approached the other cells, the bees on guard, pulled, bit her, and chased her away: they seemed to be greatly irritated against her, and she enjoyed tranquillity only when at a considerable distance from the cells. This proceeding was frequently repeated through the day. She twice emitted the same distinct sound or clacking that had been heard in her prison, consisting of several monotonous notes, in rapid succession: and in doing so she stood with her thorax against a comb, and her wings crossed on her back: they were in motion, but without being unfolded or opened. Whatever might be the cause of her assuming this attitude, the bees were affected by it; all hung down their heads and remained motionless. The hive presented the same scenes next day. Twenty-three royal cells yet remained assiduously guarded by a great many bees: when the queen approached, all the guards became agitated, surrounded her on every side, bit her, and commonly drove her away. Sometimes, when in these circumstances, she emitted the sound, and assumed the posture just described: from that moment the bees became motionless." Several queens were successively liberated, some of which had led out swarms; but eighteen cells still remained to be guarded. "The fifth queen left her cell at ten at night; and two queens were now in the hive: they immediately began fighting, but came to disengage themselves from each other. However, they again fought several times through the night, without any thing decisive. Next day, the thirteenth of June, we witnessed the death of one, which fell by the wounds of her enemy. The duel was quite similar to what occurs in the combats of queens. The victorious young queen now exhibited a very singular spectacle: she approached a royal cell, and took this moment to utter that sound and to assume that posture which strike the bees motionless. For some minutes we conceived, that, taking advantage of the dread shown by the workers on guard, she would open the cell and destroy the young female: and she in fact prepared to mount the cell; but in doing so she ceased to emit the sound, and quitted the attitude which paralyzes the workers: the guardians of the cell instantly resumed courage, and by means of tormenting and biting the queen, drove her away."

These remarks are necessary to illustrate, how one of the principal enemies of bees can attain its ends with impunity. The *sphinx atropos*, which was long unsuspected, has recently been discovered to be a most formidable ravager of their stores. In years, when they had multiplied to an uncommon extent, whole districts of hives were plundered of all their honey: and it was not until after the injury had been done, that it was traced to its real source. Numbers of moths had made their way into the hives, and satiated themselves with honey so long as it remained in the cells: and possibly as it decreased, the season when these animals abounded came to a close. But it must appear very surprising how a moth, quite unprotected with external means of defence, and liable, at the moment of its entrance, to be pierced by a thousand stings, each of which inflicts a mortal wound, can venture on so hazardous a pursuit. We must here recollect, however, that this identical insect is one, perhaps almost the only one, supposed to possess something like voice: and, at the same time, that the sound emitted by it bears a narrow resemblance to the peculiar sound proceeding from the queen bee, which paralyzes the workers. It is thence far from improbable, that the first resistance opposed to the entry of the moth may be productive of this sound, which, though arising from accident alone, may have the singular effect of depriving the bees of the power of repulsion. If these facts be firmly established, and the conclusions just, it would be well worth the attention of cultivators to investigate whether any similar sound can be artificially produced, and whether it will have influence on the bees. They are perfectly aware of the presence of so redoubtable an enemy, and the danger resulting from it. In autumn 1804, the copious collections of honey which had been made during summer, had entirely disappeared, and the moths were uncommonly abundant. The owners of a number of hives resolving to protect them from further pillage, closed their entrances with tin gratings, where the apertures were proportioned to the size of the bees, on the 17th of September; but not having enough for the whole, two were left unsecured. It was seen next morning on examination, that, during the night, the bees themselves had taken the necessary precautions, by contracting the *entrances* of their hives, so as to make them quite safe against invasion. Each was completely blockaded by a wall, composed of old wax and farina, in which the bees had taken care to leave apertures corresponding to their own size: two, that would prevent above two bees passing at a *time*, were fashioned like inverted arches; a third was broad enough in front to admit of the passage of several bees at once, but so low, that they were obliged to lean over on one side to get through. All the other hives proved, on inspection, to be constructed in the same way, even where provided with the tin gratings. In other instances, the bees had constructed a double wall at the entrance of the hive, with covered galleries, so narrow, that no more than a single bee could pass: fifty-three swarms began these operations in the course of the same night. Bees, when attacked by plunderers of their own species, have been known to adopt similar precautions. On the 9th of July, 1804, an observer having found some of those, belonging to a neighboring hive, lying dead on the board of a swarm that they had come to pillage, watched the proceedings of the latter. On the 11th of the month, they had built up their entrance, leaving only two apertures at the part highest above the board, which would admit no more than one bee at a time: they were thus proportioned to the size of their enemies, and could be sufficiently guarded by two workers. But, in the sequel, they were enlarged, and on the 22nd, they would have allowed two or three bees to pass at once. "Was this," the observer asks, "because they were sensible of having drones among them, for which these openings were too small?" No farina being in the country at that period, the bees had built their wall of pure wax taken from the edges of their combs. In a subsequent fortification erected during September, they used farina along with the wax employed in it. It is important to attend to the circumstances which we have now exposed, for they demonstrate the precise plan that should be followed by a cultivator in protecting his hives. As the seasons of danger approach, he ought himself to diminish their entrances, an expedient which will prove the chief means of security. During the period of swarming, they should be left altogether free, but after that time, they must be contracted. When in danger of being pillaged by their neighbors, there may be only two apertures, each so large as to allow two or three bees to pass: and in countries where their great enemy, the *sphynx atropos*, abounds, the apertures, when the chief collection of honey takes place, must be made very low, that this insect may be excluded. Some observers have used a longitudinal or triangular cover of the entrance, turning by one corner on a pivot; by simply elevating or depressing which, the access was impeded or facilitated. An intelligent naturalist recommends adapting a slider, containing various apertures, at the entrance of the hive: merely by shifting it along, those suitable to the different seasons and conditions will be presented for the exit of the bees.

From the preceding remarks, the necessity of frequently inspecting hives is evident; not by tearing them from the boards, as is usually done, to the manifest destruction of the combs and derangement of the whole colony, but by examining the entrance with caution, and by using hives of such a construction that part of them opens to expose what is contained within. An apparatus of the description proposed by Bergman, should be kept for weighing the hives from time to time, that the increase or diminution may be known. This consists of a steelyard hung to a small frame: from one arm of the steelyard the hive is suspended by three slight chains, and a weight shifts along the other. The common iron spring steelyards may be conveniently employed, providing their accuracy has been previously ascertained.

When seasons are peculiarly unfavorable for the secretion of honey, sometimes, we have said, a whole swarm may perish in the middle of summer. Then, or when they are deprived of too great a portion of their honey, it becomes the cultivator's care to supply the deficiency. There are various methods of doing so, always regulating the supply by the number of bees and the temperature of the atmosphere. The hive may be placed above a section of another hive containing several combs with honey; or combs may be laid on the boards of the hive before the entrance, which is less to be recommended from exposing the bees and their provisions to the invasion of strangers. Syrup of sugar, treacle, and other sweet substances, may be given them as food, introducing their allowance every afternoon in nutshells, or in a vessel with a grated covering, by an opening in the back of the hive. Unless the supply be daily administered, it is extremely difficult to preserve the bees; and by admitting of longer intervals, the most skilful cultivators have failed. A practical operator informs us, that he takes an oblong box, in one end of which is a reservoir containing honey, that is allowed to flow from the bottom of the reservoir under a thin float buoyed up by cork. This float has many small perforations, through which the bees standing on it supply themselves with the honey. There is one hole in the side of the box, which is to be applied to the entrance of the hive, for admitting the bees above the float, and another on the opposite side, which is opened at pleasure, to allow them to escape, should the box be too much crowded. The lid of the box is a glass pane. On pouring honey into the reservoir, the float rises, whence there should not be such a quantity as to raise it close to the lid or pane above. The box is about ten inches long, four broad, two and a half deep, and the reservoir is an inch wide. When used, the hole in the side is to be placed close to the entrance of the hive, which must be gently rapped on if the bees do not immediately find the way down. It is entertaining to observe bees accustomed to be fed in this manner, watching the approach of the feeder; when the ordinary time draws near, they rush down to the box the moment that it is put on the board, and after speedily filling themselves they return to the hive, from which they very soon come back for a second supply. By throwing a little fine flour on those leaving the box, it will be seen that they can fill themselves in three minutes, and are absent not above five. One convenience that attends feeding in such a box, is the exclusion of stranger bees; as the sole communication with the interior is from the entrance of the hive. Several practical operators recommend a mixture of sugar and small beer as food, which we should warn others to be cautious of adopting, as they will find honey or syrup quite adequate to their purpose. It is maintained that fruit may likewise be presented to bees for feeding them.

Supposing, by a concurrence of favorable circumstances, that a hive is well provided with bees; that they are protected from enemies, their collections ample, and their brood abundant; the cultivator has to watch it strictly during the summer season when swarming takes place; it is only during the warmer weather that bees swarm, on fine days, and when the heavens are unclouded: if the sun be overcast, they hesitate to depart, awaiting the moment when he shines forth in full lustre. Though what are called precursors cannot be depended on, as we have shown, they are not to be altogether neglected; and in attending to them the time of swarming will scarcely be overlooked. It is commonly between ten and three o'clock, sometimes a little earlier or later, that a swarm leaves the hive, during which interval the owner should be on the watch to follow it. A sudden buzzing is heard, the bees are seen in innumerable multitudes traversing the air in all possible directions, and the entrance of the hive soon appears deserted. After wandering about for some minutes, they are generally seen in small clusters, on some neighboring shrub or tree, which gradually unite round the queen, and all are collected together in a single heap. If they rise high in the air, it frequently indicates their inclination to take a long flight, which is usually endeavored to be checked by beating pans, ringing bells, and throwing dust or sand among them. The former can have little influence; if it does operate, it may be by producing a slight concussion of the air, which, alarming the bees in the same way as thunder, may induce them to settle; but the discharge of a fowling piece would have much more effect. Bees are conceived to mistake the dust and sand for rain, which they greatly dread; and we often observe them hastening to the hive on the approach of a shower, or when the sky becomes cloudy. Notwithstanding every effort to retain them, they sometimes rise very high, fly to a distance, and are irrecoverably lost. As they are said to fly in a straight line after having taken their direction, they must be pursued, as there is no other method of discovering where they alight. The place of their settling is extremely uncertain. Bonner says they will fly four miles to take possession of a dead hive, and affirms, that he has seen a swarm go into a living one that stood in the same apiary. If they alight in an accessible place, on the branch of a tree for example, after allowing them to settle completely, it must be gently cut off and laid on the ground, and a clean hive supported on two sticks put over it, and the whole covered with a sheet or large table cloth. The bees will soon ascend into the hive, and immediately begin working: late in the evening, when all is quiet within, the hive is to be transported to its station in the apiary. When the cultivator can, by any device, catch the queen and put her into the hive, all the bees will quickly follow. This is more essential to attempt, when the place where the swarm has settled is of difficult access; such as flying to the roof of a house, or the cleft of a tree. Then it is far from easy to dislodge the bees, which is, in the majority of cases, the sole method of recovering them; as we can hardly sanction the following method recommended by Bonner: "The owner should make as much room as possible to get his hand introduced, so as to pull them out by handfuls, and put them into an empty hive." Bees very quickly commence working even in the most exposed and unsheltered situations, unless removed to a hive. The operator should be provided with a dress to protect him from the stings of the bees: the best expedient is to have a close leather jacket and trowsers; the head and face covered, and goggles of gauze to save the eyes. Bees are less disposed to sting during their swarming than at all other times; and there have been instances of their settling on a person's head unattended by inconvenience. We have an authentic account of this from Thorley. "In the year 1717," he observes, "one of my swarms settled among the close twisted branches of a codling tree; and not to be got into a hive without help, my maid servant, being in the garden, offered her assistance to hold the hive while I dislodged the bees. Having never been acquainted with bees, she put a linen cloth over her head and shoulders, to guard and secure her from their swords. A few of the bees fell into the hive, some upon the ground, but the main body upon the cloth which covered her upper garments. I took the hive out of her hands, when she cried out the bees were got under the covering, and crowding up towards her breast and face, which put her into a trembling posture. When I perceived the veil was of no farther service, she gave me leave to remove it: this done, a most affecting spectacle presented itself to the view of all the company, filling me with the deepest distress and concern, as I thought myself the unhappy instrument of drawing her into so imminent hazard of her life. Had she enraged them, all resistance had been vain, and nothing less than her life would have atoned for the offence. I spared not to use all the arguments I could think of, and using the most affectionate intreaties; begging her, with all the earnestness in my power, to stand her ground and keep her present posture; in order to which I gave her encouragement to hope for a full discharge from her disagreeable companions. I began to search among them for the queen, now got in a great body upon her breast, about her neck, and up to her chin. I immediately seized her, taking her from among the crowd, with some of the commons in company with her, and put them together into the hive. Here I watched her for some time, and, as I did not observe that she came out, I conceived an expectation of seeing the whole body quickly abandon their settlement; but instead of that, I soon observed them gathering closer together, without the least signal for departing. Upon this I immediately reflected, that either there must be another sovereign, or that the same was returned. I directly commenced a second search, and in a short time, with a most agreeable surprise, found a second, or the same. She strove by entering farther into the crowd, to escape me, but I reconducted her with a great number of the populace into the hive. And now the melancholy scene began to change, to one infinitely more agreeable and pleasant. The bees missing their queen, began to dislodge and repair to the hive; crowding into it in multitudes, and in the greatest hurry imaginable; and in the space of two or three minutes the maid had not one single bee about her, neither had she so much as one sting, a small nnmber of which would have *quickly* stopped her breadth."

Supposing that the cultivator desires to augment the number of his hives, without awaiting the period when swarming naturally ensues; or that its operation is checked by the uncertainties of weather, predominant in our climate above all *others*, he may resort to the expedient of obtaining artificial swarms. Several young queens originate at once in a hive; and the production of two is sometimes so immediate, that although both cannot survive together, they come off in the same swarm. As, by M. Shirach's discovery, bees having lost the queen can procure themselves another, providing there be worker's brood in the combs, we can at pleasure rear successive queens simply by removing the first. If a hive is strong enough, therefore, it may be divided in two; one-half will retain the old queen, and the other will not be long of obtaining a young one. Shirach directs, that the appearance of brood in a hive containing a queen is to be ascertained, which is always about the time that the trees are in blossom, or a little later in Britain. Three or four pieces of comb, with the brood, are to be cut out of the hive, and placed in a rack-work adapted in another hive in the same position as in that from which they came, and three or four hundred bees must be confined along with it; unless the hive be very large, they should not be numerous; and seven or eight hundred will always prove more than sufficient. Nearly fifteen days being requisite for the production of a queen, as much honey should be supplied every two days as will serve for subsisting the bees. The hive is then to be closed up and transported to a place where the temperature is moderate. Violent agitation ensues among the bees whenever they discover that they are imprisoned, and the tumult becomes still greater on their ascertaining that their sovereign is no longer with them. Silence succeeds, which is next followed by greater noise and confusion than what attends swarming. Immediately afterwards a new operation begins, and from the second day the construction of a royal cell is seen. The confinement of the bees must be protracted some days; but the fourth or fifth, the hive may be carried into a garden, and the prisoners allowed to escape. Their eagerness to do so is such, that hardly one remains in the hive; however, in two hours they return to it again. The entrance must still be closed at night, and the hive carried into a house, unless the fineness of the weather admits of it being left without. If the operator, on opening the hive, finds the brood hatched, and the royal cells well advanced, he should transfer the whole along with the bees into a dwelling of greater capacity, provided a small box has been used with three or four combs of white wax fixed near the top, that the interior may resemble a hive containing work already commenced. Should the queen be hatched, it will facilitate the operation if she can be transferred to the new dwelling: and thus the artificial swarm is formed. It is difficult to perform this operation with the common straw hives; but an expert person may accomplish it by means similar to those adopted in robbing the bees of heir provisions. Here the use of the book or leaf hive is especially demonstrated; for it affords facilities in forming artificial swarms infinitely surpassing any others that have yet been devised. Under the conditions above specified, of brood and population, the leaf hive is to be gently separated n the middle, and two empty frames insinuated between the halves. The queen must then be sought for in one of the halves, and a mark put on her, in order to avoid mistake. Should she by chance remain in the divisibn with most brood, she s to be transferred to the other containing less, that the bees may have every chance of obtainng another female. Next, it is necessary to connect the halves together by a cord tied tight around hem; and care should be taken to place them on he same board which the hive previously occupied. The old entrance, now become useless, will be shut up; but as each half requires a new one, hese ought to be made at the extremities of the two divisions, on purpose to be as far asunder as possible. Both, however, should not be made on the same day. The bees in the half deprived of the queen, ought to be confined twenty-four hours, and no opening made before the lapse of that ime, except for the admission of air; otherwise they would soon search for the queen, and infallibly find her in the other division. But provided wenty-four hours be sufficient to make them forget their queen, this will not happen. When all circumstances are favorable, the bees in the division wanting the queen will begin to labor in procuring another; and about fifteen days after the operation, as before observed, their loss will be repaired. "The young female they have reared," according to Huber, "soon issues forth to seek impregnation, and in two days commences the laying of workers' eggs. Nothing more is wanting to the bees of her division, and the success of the artificial swarm is ensured." The time of resorting to this expedient is, when the males are about to originate or actually exist: if attempted earlier, the bees will be discouraged by the sterility of their young female. The structure of the leaf hive enables us easily to ascertain the concurrence of the necessary conditions; for by simply opening the frames successively, their whole contents are exposed to view.

Should the original queen be accidentally lost or destroyed, the cultivator has still another means of preserving the whole colony, which, destitute of workers' brood, would infallibly perish, by substituting a new one in her place. Bees are not immediately sensible of the loss or removal of their queen; their labors are uninterrupted; they watch over the young, and perform their ordinary occupations. But in a few hours agitation arises; all appears a scene of tumult in the hive; a singular humming is heard; the workers desert their young, and rush with delirious impetuosity over the surface of the combs. Then they discover that their queen is no longer among them. There can be no question that this agitation is the consequence of bees having lost their queen; for should she have been intentionally removed, tranquillity returns on restoring her, and, what is very singular, she is recognized. If a stranger queen be introduced after the reigning one is lost or taken away, the agitation continues; the stranger is surrounded, seized, and kept captive by the bees in an impenetrable cluster, where she usually dies either of hunger or from the privation of air. If eighteen hours elapse, the stranger is at first treated in the same manner, but with less rigor; the bees gradually disperse, and she is at last liberated. But should there be an interval of twenty-four hours after the loss of the original queen before the stranger one is substituted, "she will be well received," to use the words of an eminent author, "and reign from the moment of her introduction into the hive." On this head, which it is extremely important for the cultivator to be intimately acquainted with, we are indebted to Huber for some interesting experiments. On the 15th of April, he introduced a fertile queen, eleven months old, into a glass hive, where the bees, having been 24 hours deprived of their queen, had already begun to construct twelve royal cells. Immediately on placing the stranger female on a comb, the bees in the vicinity touched her with their antennæ, and passing their trunks over every part of her body, supplied her with honey. These then gave place to others, by which she was treated exactly in the same manner. All vibrated their wings at once, and ranged themselves in a circle "around their sovereign." Hence resulted a kind of agitation, which gradually communicated to the workers situated on the same side of the comb, and induced them to come and see what was going on. Soon arriving, they broke through the circle formed by the first of their companions, approached the queen, touched her with the antennæ, and gave her honey. After this little ceremony, they retired, and, standing behind the others, enlarged the circle. There they vibrated their wings, and buzzed as if experiencing some very agreeable sensation. In a quarter of an hour the queen began to move from her original position, when the bees, so far from opposing her, opened the circle at that part towards which she turned, and formed a guard around. While such incidents occurred on the surface of the comb where the queen stood, all was quiet on the other side. Here the workers apparently were ignorant of the queen's arrival in the hive. They labored with great activity at the royal cells, as if still ignorant that they no longer stood in need of them; they watched over the royal larvæ, supplied them with jelly, and the like. But the queen having at length repaired to this side, she was received with the same respect by the bees as she had experienced from their companions on the other side of the comb. They encompassed her, gave her honey, and touched her with their antennæ; and what proved better that they treated her as a mother, was their immediately desisting from work at the royal cells; they removed the worms, and devoured the food collected around them. "From that moment the queen was recognized by all her people, and conducted herself in this new habitation as if it had been her native hive." Thus when bees have had time to forget their own queen, they receive one substituted for her with greater interest, or, perhaps, with more conspicuous demonstrations of it. The cultivator must, therefore, carefully practise one of two things when a queen is wanting in any of his hives; he has either to procure a new one by supplying the bees with brood comb, whereby the loss will be repaired in about fourteen or fifteen days, or he must substitute some supernumerary queen, in which case the impending evils will be completely averted in twenty-four hours.

If two clusters of bees form in swarming, and remain quite separate and distinct from each other, it shows that two queens have left the hive at the same time. But no single swarm being too large, it is necessary, for the welfare of the community, that one of the queens be sought for, and sacrificed, on which the whole bees will unite. There are other situations when it is also beneficial to join two or more swarms together; such as when they are weak on leaving their hives in the summer season, or are sparingly provisioned or peopled towards winter. Numbers, we repeat, independent of affording a better security against external enemies, and in promoting the general activity, are more calculated in society to resist the inclemency of the weather. Those persons, therefore, who cultivate bees solely for the sake of profit, estimate according to the weight of a hive whether it be sufficiently strong. Hives under four pounds, being supposed to contain about 20,000 bees, are rejected; but Bonner affirms, that one consisting of 15,000 will do well, providing the season be not far advanced. The reader will not forget what we have observed of the discrepancies among naturalists concerning the number of bees in a given weight. The last mentioned author, who was a practical operator in uniting swarms, directs, that the mouths of two hives, the lower one full and the higher empty, are to be applied to each other, and a sheet, or large cloth, put round them. "The undermost hive must then be rapped with both hands, in the manner a drum is beat; rapping chiefly on those parts of the hive to which the edges of the comb are fixed, and avoiding the parts opposite to the sides of the combs, lest they should be loosened, and, by falling together, crush the bees between them, as well as the young in the cells. The more bees there are, the sooner will they run into the new hive; for the concussion of the hive by rapping alarms them as an earthquake alarms mankind, and they run to the upper hive in search of a safer habitation. When the bees are thus removed into the new hive, it may be placed where the old one stood, which will collect all the bees together, and within ten minutes the bees will begin working as leisurely as any natural swarm." By this means the under hive will be left quite empty, and another may be substituted, in order that three swarms shall be united. Clusters of bees may also be introduced into a hive to strengthen it, and they are generally received without fighting. While the bees are very active, the places of a strong and a weak swarm may be interchanged; the number of the former which are out being much greater, will return to the latter as their own dwelling, and thus strengthen it. There is likewise an easy and simple method of uniting swarms, which consists in spreading a cloth at night on the ground, close to a hive where two new swarms are to be joined. One of them is to be brought, and put on a stick laid across the cloth, when, giving their hive a smart blow, they will drop down in a cluster. This done, and the empty hive thrown aside, the other should be expeditiously taken from its board, and set over the bees, which will speedily ascend into it, and unite with its inhabitants. By the means here described, a swarm may be increased to any given extent. Bonner assures us, that his mode may be practised in the middle of the day with little danger, and that he has taken off four swarms in one forenoon without a single sting.

It is ungrateful to reflect, that, after all our care in watching the progress of bees, in screening them from injury, added to our admiration of their singular industry, we must at once sacrifice so many thousand lives in order to come at their stores. Yet such is the general, though pernicious practice; and whole colonies, which, in another year, would send forth tens of thousands equally industrious as themselves, are utterly extirpated. The mode of doing so is well known. When the hives cease to increase in weight, or, rather, when they begin to grow lighter, a hole is dug in the ground, and some rags dipped in melted brimstone being inserted in the clefts of twigs stuck into the earth, the matches are kindled, and putting the hive above them, the bees are quickly suffocated, and fall down in a heap. Some authors strenuously defend this practice, contending, that all expedients to save the bees are both difficult and precarious, and that they do not produce the same advantages. We conceive that its facility, combined with inveterate adherence to established customs, has proved a strong recommendation. But the majority of modern cultivators are disposed to preserve the bees, while they share their collections. Towards the end of September, when all the flowers have faded, when there is little brood in the combs, and the bees are beginning to consume the honey they have laid up, they may be frightened out of the hive by beating on it, and the combs then safely taken away. This, however, would reduce the owner to the necessity of feeding them during winter, whence an earlier season is generally chosen for it, that the bees may still have time to lay in winter provender. The highest part of a hive being always filled first, and with honey of the finest quality, it may be taken in the midst of summer if the bees are kept in boxes, simply by removing the upper one, and substituting another below, if that be required. As every comb is seen in the leaf hive, any one of the whole can be removed at will, and new divisions inserted. The stores of the bees should be moderately partitioned with them, and due regard always paid to the advancement of the season, and the state of the atmosphere. We cannot tell how much they will produce. Thorley declares, that, in some summers, he has taken two boxes from the hive, each containing thirty pounds of honey. We hear of hives weighing seventy, eighty, or even a hundred pounds; but these bear no comparison with what M. Duhamel relates. A clergyman in France, who had placed a well stocked hive over an inverted tub with a hole in the bottom, obtained no less than 420 pounds of honey and six of wax from it. The cultivator should know the exact weight of his hives, and mark their gradual increase or diminution, which will enable him to ascertain the proper time of taking the honey. Bonner judiciously observes, that "the harvest of honey, like that of corn, is earlier or later, more plentiful or scarce, in different years, according to the weather and the climate, and the variety of the seasons and situations." Sometimes he has known a hive become gradually lighter after the first week of August; at other times, in favorable weather, hives situated near heath have continued working actively during the whole of August, and the greater part of September, and daily became heavier.

Of the practical separation of honey and wax we need say little, as it is universally understood by those who cultivate bees for profit. That honey which is most fluid, and runs most easily from the comb, is considered the best and finest. To promote the separation of the rest, the combs should be cut into very small portions, and exposed before a fire, to render the honey more liquid; the product will be honey of the second degree of fineness; and the remainder should be heated still more in a vessel over a fire, and then squeezed through a canvas bag, which will produce a coarser kind, well adapted for feeding bees. It facilitates the operation, to erect a stage of three or four sieves, one always finer than the other from the top, and in a short time the separation is effected. Honey-comb, wrapped in paper, and kept in a cool place, may be preserved entire during a whole winter or longer. To purify the wax, nothing more is necessary than boiling the empty combs, and those deprived of the honey, in water, and removing the scum which will rise in the sucessive meltings. The Abbe della Rocca proposes to put a quantity of comb, tied up in a linen or woollen bag, into a cauldron of water; as the heat increases, the wax liquefies, and, escaping through the interstices of the bag, rises to the surface, while the refuse is retained behind. This is a simple, and, as we conceive, very effectual method.

We apprehend that very few precautions are necessary for preserving bees in winter. They are not torpid in that season, provided they be numerous, and then they cluster together towards the top of the hive. But, like other insects, they are liable to torpidity when single, or where there are few collected together, and that torpidity, by an extraordinary increase of cold, will end in death. With the view of saving their provision, it has been proposed to keep bees torpid, or in an ice-house all the winter. It is undoubted that in a certain degree of cold they cease to consume honey, and animals may live an indefinite time in a state of torpidity. The hives ought not to be exposed to sunshine in the depth of winter; for bees are induced to go out, and the sudden cold that follows deprives them of the power of returning.

The cultivation of bees forms one considerable branch of rural economy, and we could wish to see it much farther extended. This country is capable of supporting at last four or five times the number of hives now kept in it; and, without indulging in the speculations of extravagant profit, which are generally entertained by the authors who write on the subject, we will confidently affirm, that every one who attempts keeping bees on a moderate scale, and pays them some attention, will find it advantageous. There are repeated instances of bees swarming naturally three times during the season; and in the present year, 1810, we have known five swarms come from a single hive. Bonner calculates, that 20 stock hives in each parish of Scotland, or 16,000 in all, would in seven years, by each merely producing one swarm, augment to above two millions and forty-eight thousand. He allows a deduction of forty-eight thousand for losses, which leaves two millions of stock hives. The loss, however, would be much more considerable; but from the parishes being about a fifth above what he supposes, the difference will not be proportionally great. Such an increase could hardly follow, and some unfavorable years might be destructive of most of the stock; yet, on the whole, the hives would be numerous compared with what they were in the outset. By another calculation, he supposes an individual purchasing five hives at 1*l.* each, will obtain, in ten years, 2560 swarms, which, valued at 10*s.* each, makes a profit of 1280*l.* He supposes that each hive gives one swarm annually; if they give more, that the latter are to be allowed for expenses and incidental losses. But in similar calculations we should hardly look further than three years; and it is quite moderate enough to say, that each hive will give one swarm, which may be preserved until the end of the third year. Therefore, as the price of hives in this year, 1810, is 2*l.* 2*s.*, supposing a stock of ten is obtained, it is far from improbable, that, at the end of the third year, it will be found to have increased to eighty; and it is likely, also, that other thirty or forty swarms have left the stock hives, or that first swarms have sent out a colony. The reasons we have already given show why an excessive number of bees cannot be maintained in one place; and speculations in rearing them should be divided among several individuals residing in different districts. The trade of foreign countries in wax is very considerable; and the increasing demand for it may render the culture of bees more worthy of notice at home. In the year 1806, there was exported from the port of Mogadore, in Africa, 234,555 pounds of bees wax.

The honey bee is frequent in the wild state in warmer climates, but is very rarely to be found in Britain; nevertheless it is said to exist; and that a hive was discovered within these some years. Thus the animal may have either been domesticated at a very remote period by the inhabitants, or it may have been brought from abroad. Naturalists doubt whether the wild honey bee is a native of America, though existing in numbers in the woods. It is rather supposed to have been carried thither in the sixteenth or seventeenth century. Honey is said to be a great article of subsistence in Madagascar, and in other places where bees are common in the clefts of trees. In Africa, there is a small bird called *cuculus indicator*, or the honey bird, which uttering a peculiar note, and flitting from bough to bough, will infallibly lead the traveller to a swarm in some hollow of a tree.

FRUIT TREES.

From the Newburyport Herald.

The famous Pickman farm, in Salem, the best in the country, is lined round the borders of the field, with engrafted apple trees. These trees are very thrifty, deriving most of their nourishment from the ground under the stone fences, which keep the soil loose, warm and moist, and preserve the roots of the trees from external injury. The trees in this situation are an ornament to the farm, while they are no hindrance to the farmer in cultivating his field, nor injury to the crops by withdrawing nourishment, like those in the interior of the field. Yet those trees round the field, are believed to yield a greater profit than the annual crop within, with all the labor necessarily bestowed upon it; and the annual sales of the apples and fruit on this farm are said to be enough to purchase a farm of moderate dimensions in the interior of this state.

WOOL.

From the Genesee Farmer.

Few are aware of the importance of this article, as an item in our productions, or the amount which it already reaches in the sum total of value. Two years since the number of sheep was estimated at twelve millions; it is now not less than fifteen millions. Allowing the estimate of three pounds per head, the clip of the present year would be forty-five million pounds of wool. We have been careful observers of the price of wool, and find it has ranged from 40 to 60 cents per pound, some few lots going above, as some have fallen below, the prices named. To be sure of being within the amount, we will take the average at 45 cents, and at that rate, the last clip of wool would be worth more than twenty millions of dollars. Yet this is but one item in the productive industry of the north.

At the present prices of sheep and wool, the business of growing them is a profitable one; and we think may with safety be calculated upon as a good one for time to come. Wool of good quality could hardly fail to pay as an article of export to England or France, should present prices abroad be maintained, and the supply for home consumption in this country be exceeded. To prove that growing wool is a good investment of money, we have only to look at the cost, expenses and returns of a flock. A flock of good ewes, with proper management, will hardly fail of doubling their numbers within the year; and if to the sales of the wool the value of the lambs is added, it will be seen, after deducting the expenses of keeping, that a handsome profit remains. But to have good sheep or wool, more attention must be paid to them than is usually given. Sheep that get their living by hook or by crook; that are allowed to gather in their fleeces all the burdock and other burweeds that line too many of our roads and fences, and fill our woodlands; that are exposed to all the vicissitudes of our severe and variable climate without shelter; or barely make a [shift to] live through the winter, cannot be expected to raise many lambs, or produce good wool. Wool and silk are to be the great resources of our supply of clothing hereafter, and their importance to the country will be proportioned to their general use.

SWEET POTATO PLANTS STARTED IN HOT-BEDS—A NEW METHOD.

From the Southern Cultivator.

Monrovia, Ark. *July* 17, 1839.

Mr. D. CLAYTON.

Dear Sir.—Your invitation to the readers of the 'Cultivator' to offer to the public through its columns, the result of any experiment, or information acquired in any other way, that would enlighten the public mind on the all-important subject of agriculture, seems to be general, and not directed alone to the learned and literati, but alike to the *clodhopper* and scentific agriculturist; which encourages me to submit to the public a new method of bedding out sweet potatoes; though with the utmost diffidence I assure you.

By using a hot bed, made on the following plan, which was suggested to me by one of my neighbors. I drew slips from my yams and Spanishes, on the 10th of April, and by the last of June, the yams had attained the ordinary size of "eating roots;" and I have this moment measured three, that are from 6½ to 7 and 7¾ in. in circumference. It was perhaps owing, in a certain degree, to the season being unusually forward.

For one bushel of seed, I made a bed 8 feet long, and 4 wide, (wider than this would be inconvenient,) by driving posts into the ground, and weather-boarding up 2 feet on the east side and each end, and on the west side 5 feet, so as to give the advantage of the morning sun, and shield it as much as possible from the scorching influence of the evening sun. I filled up my box with straw 2 feet deep, made as solid as possible by mauling, and then covered it 4 or 5 inches thick with good stable manure. I then wet it thoroughly to the ground, and spread a coat of light soil, clear of clods, 1½ inches thick. My potatoes were then placed in so as not to touch each other, and covered 3 or 4 inches deep with the same kind of soil. The first coat of slips was ready to come off in four weeks from the day they were bedded, and I am of opinion they would have been ready sooner, if the bed had been moistened oftener, so as to have prevented a crust forming on the top, which the tender plant could not break. Artificial waterings are indispensable, in the absence of rain, at least once a day.

M. F. SADLER.

CEDAR QUARRIES.

From the Oswego Palladium.

"On asking a friend from Oswego the other day, who used this term, what it meant, he informed us that much of the cedar which comes from Lake Ontario, is absolutely dug out of the soil. On some of the islands in that lake, which furnish great quantities of that valuable timber, there has not been growing a single tree for many years.' Generation has succeeded generation of this timber, and fallen, and been successively covered with earth, and is now dug out for rail-roads, fence posts, &c., in a perfectly sound state."

The above is from the 'Cultivator'. Persons who have been on the island have stated to us similar facts. We believe, however, the quarries are getting exhausted of their most valuable mineral, the *red* cedar, or that it is so deeply imbedded, that that the labor of excavation is not sufficiently rewarded. During this season, all the cedar importations have been of the *white* species. We have heard it stated that on some of those islands, the Ducks and Pigeons for instance, at the north-eastern termination of the lake, there are subterranean passages prevading their whole area. That the roof or exterior surface seems to be composed of agglomerated earth, matted and held together by the roots of trees which rest upon it and have covered it with a thick growth of timber. The vaulted passages or dens below, are filled with cedar logs lying in every variety of position, and which no doubt, formerly, like the rafters of a house, gave support to the superincumbent mass. From the accounts we have had, there are more wonderful labyrinths constructed by nature on Lake Ontario, than that of old upon the banks of Lake Mœris.

MODE OF PRODUCING FINE SOUND PEACHES, FROM TREES PREVIOUSLY UNPRODUCTIVE.

From the Southern Agriculturist.

I opened the roots near the trunk, in the latter part of the winter, to retard the vegetation and expose the worms. I searched the roots where joined to the trunk, and where gum oozed from them, I scraped it away, killing the worms and destroying their eggs. I then directed chamber-lie to be thrown daily round the roots of the trees near the trunks until the 1st of May. When the trees budded, I had the hole round the roots filled with marsh-mud, and some of them with marsh-mud and clay, in equal proportions, extending up to the hard bark of the tree. Over this I threw the poorest sandy earth that I could find, all round under the branches of the trees, and excluded all stable manure from the trunks. If any grass grew up through the sand, I had it hoed from under the trees. When the trees are not vigorous in their growth, I dig a trench round them from three to six feet off from the trunk, according to the size of the tree, and throw manure into that trench, and cover it with barren sand. This is the third summer of my owning these peach trees; two of them were out in the field among vegetables, none were n the yard among the poultry. In the first summer, none of the fruit was matured or worth eating. In the second year they were very fine, sound, healthy, and profitable. This year, equally fine, perhaps better flavored, more productive, and more profitable.

PAUL REMLEY.

Charleston, July 12, 1839.

ON THE CULTIVATION OF THE CAULIFLOWER, AS PRACTISED ON THE FARM OF C. W. WOLBERT, ESQ., AT FRANKFORD, NEAR PHILADELPHIA.

From the Magazine of Horticulture.

Having met with unprecedented success in bringing the cauliflower to the highest state of perfection, by the same simple process of cultivation as the cabbage, and with the hope of stimulating others to "go and do likewise," I am induced to lay before you an extract from my garden diary:—

"Purchased the seed of Messrs. Landreth & Co.; sowed it broad-cast Sept. 19th, 1838, in a bed of common garden mould.

"October the 26th, removed the plants into a cold frame of the same kind of mould.

"April 10th, 1839, transplanted them into the open garden.

"May 29th, cut for the use of the family."

These noble plants stood in the open garden, undaunted, and, with their neighbors, the cabbage, patiently endured "the pitiless pelting of the storm."

My success is fully demonstrated by the following statement of the circumference of six *heads* of the flowers, wholly divested of their leaves.

	Circumference.	Weight.
No. 1	3 feet 1 inch	8 lbs.
No. 2	2 feet 7¾ inch	
No. 3	2 feet 6¾ inch	
No. 4	2 feet 6 inch	
No. 5	2 feet 5¾ inch	
No. 6	2 feet 5½ inch	

The circumference of the largest flower, as it, stood in the garden, and taken at the *extermity of the leaves*, was 13 feet 7½ inches.

I continued to cut abundance of fine flowers from May 29 to the middle of July.

With this I send you some remarks by the Editor of the *United States Gazette*, who examined some of the plants on the 15th of last month. [This appeared in our last number, p. 308.]

My object in this instance, is publicity, especially as flowers of this immense size *can only be obtained from fall plants*. I am a subscriber of yours, and I shall feel a pleasure in communicating and corresponding with you upon the subject of horticulture.

I am, gentlemen, respectfully yours,

GREGORY LEE.

Frankford, Near Philadelphia, July 31*st*, 1839.

[Mr. Lee will receive our thanks for the above communication, and it will give as great pleasure to hear from him often through our pages. Practical articles are of real value, and, unless professional men came forward readily, and give their methods of cultivation, horticulture will make but slight advancement. We trust that other cultivators will not only adopt Mr. Lee's plan of growing this excellent vegetable, but will imitate his example, by giving to the public the success which may attend their method of cultivating every plant, fruit or vegetable, which will render them easier attainable by all.—*Ed. M. H.*]

ON CHANGING THE COLOR OF THE FLOWERS OF THE HYDRANGEA.

From the Magazine of Horticulture.

What is there more beautiful and cool to look upon, of the flower kind, than the hydrangea? Placed in the shady piazza, or window, it seems to luxuriate with you in the cooling breeze of the hot summer's day; participating the communing with you in the luxury of light, shade and air. Why! it will cool you, after a warm walk, to look upon its large bright trusses of flowers contrasting with the broad deep green foliage. Then let me suggest to those of your readers who may delight in this beautiful plant, how they may make it sport its colors, showing some very beautiful blending of shades.

For several years past, I have been studying to effect this. Some of my friends suggested the watering of the plants with soap-suds from the time the buds begin to expand; others, a mixture of peat ashes, or the ashes of pitch pine, with the soil; soap-suds produce a luxuriant growth and large flowers; and the ashes only cause some very slight change in the coloring of the petals: others, again, have advised some peculiar compost, in which the plants should be grown.

My own experience convinces me that the best compost for the growth of the plant, is, one half rich garden loam, one fourth old hot-bed manure, and one fourth coarse sand, the whole to be well mixed together. The plants sould stand in a situation where they will only receive the morning or evening sun for an hour or two. When the buds begin to expand, or after they have opened, the plants should be watered with water in which have been dissolved saltpetre and oxide of iron, in the following proportions:—to a table spoonful of saltpetre and a half a one of oxide of iron add one pail of water; these should be well stirred together, and the whole allowed to stand exposed to the atmosphere a day or more, or until it has acquired a temperature of 70°.

I am fully satisfied with the very beautiful variety of coloring which this fine plant produces under this mode of treatment, and I am pleased to communicate this to your readers, hoping that they may meet with the like success; and if they will inform us, in return, of any thing which will effect any other changes in the tints of the blossoms, they will oblige all who love the Hydrángea hortênsis. Yours,

John D. W. Williams.

Elm Hill, Roxbury, July 26, 1839.

GREEN CROPS FOR MANURE.

If our absence had not prevented, the queries from H. on the above subject, which were printed in the last number, would have been answered by some remarks immediately following. But the answer would have been merely offered in courtesy, and not for any value of our own practical experience on this subject. The following selected article may serve in some measure to inform H.; though we incline to believe that the writer has, in comparing the values of green crops and dry leaves, as manure, much undervalued the latter material.

In selecting plants to raise and turn in for manure, there are strong reasons for preferring leguminous plants, or the pea tribe, to any grain, (as oats;) and, also, broad-leaved to narrow-leaved plants. All plants draw a large part of their nutriment from the atmosphere, of which foreign supply to their bulk, a greater or less portion is given to the soil on which they grow, by their death and decay, whether the plants be green or dry, or killed and applied by natural or by artificial means. There is no doubt as to this general position; but scarcely any thing is yet known precisely as to the comparative enriching values of different plants, and in different conditions.

Though knowing nothing from properly conducted experiments, or practice, in regard to turning in green cultivated annual crops, we would be directed by reasoning to choose for this purpose, in preference to oats, rye sown on corn ground in September, as early as the corn could be safely removed; next the rye turned under when in blossom, and field peas then sown broad-cast, which would also be turned in, in full growth, and wheat sown. This, besides other advantages, would doubtless serve well for another object of H. which is to cure land over-dosed with marl. Vegetable matter supplied in any form, is the cure for this injury, and of course that object will be best and most cheaply effected by such mode as will most cheaply and effectually enrich the land. [See 'Essay on Cal. Manures,' 2nd Ed., p. 52.]

Our general views on this subject will be given more fully hereafter. In the mean time, we unite in the request to all other persons for information as to results of the practice of green manuring. —Ed. F. R.

ON IMPROVING WORN-OUT LANDS.

From the Southern Agriculturist.

Dear Sir;—In your last favor you say, "that about three years ago I published an article in your journal, wherein I recommended the owners of poor lands to improve them, by planting a crop of small grain; then peas, broadcast; and these to be ploughed under before hard frost, for the next year's culture." This, I said, was the practice in Georgia. At your request I am now prepared to testify to the excellence of the suggestion, by my own, and the experience of others. To any kind of soil, green matter, turned under, is ever an advantage, because it returns to the earth what it takes; and much that it has absorbed from water and the atmosphere. However, a few general remarks are necessary before I give you "my say."

It seems that near every exhausted soil in this state, there is some material in approximation to revive it—that is, clay or marl, high sandy lands, and vegetable matter in a state of nature, or to be produced by culture, nigh all of them. And to one or more of these materials, must we look for the renovation of the soil. By mechanical or chemical combinations, it may be made susceptible of improvement; but after all, vegetable matter in decomposition, or any substance that, when decomposing, will give out the elementary principles of vegetables, such as carbon, hydrogen, and oxygen, constitute the food of plants. Moreover, it will be found in the culture of corn and cotton, or in any other crop planted in as large quantities to the hand, as we do, the soil must be invested by some material in approximity, or the yield will not pay for the cost of manuring. Manures that act as chemical agents, that is, that induce the decomposition of the vegetable matter, may be fetched from a distance; but it will be found that, for any other purposes, their expensiveness will not pay the planter in the yield of short cotton. If these premises be correct, of which my attention to manures has assured me, the first questions for the owner of poor lands to ask of himself are:—1st. What is the nature of my soil?—is it chiefly clay, or marl, or sand; or combined of those three original earths? 2dly. What vegetable matter have I nigh me, or if none, or not in sufficient quantities, how shall I procure it?

To the first inquiry, after he is answered, he will then say—*that soil which absorbs most moisture from the atmosphere, and readily gives it out, is the best for cultivation;* and that a due admixture of clay, sand, and marl, presents the soil desired; and if there is no marl at hand, clay, mixed with sand, and gravel or sand mixed with clay, he may use as next in value. Now, to make these combinations of soils, either of two plants may be selected. The first and most effectual would be, to cart into the field, that one, or more of "the original earths" required, and plough them in: the second would be to mix them in the cow-pen and stable with the manure, to be carted out. Having in this way *created a soil susceptible of being improved by manure,* the planter should then look to the second question; which, because of its importance, I shall dwell on somewhat at large.

To the second question. If the planter has an abundance of dry leaves at hand, he may use them; if not, he may plant rye or wheat; which, being winter growths, can be turned under for the spring crop. And as I am satisfied that the planters of short cotton in the middle and upper country will sooner or later have to use dry or green vegetable matter as a manure, to the relative value of each, let me call your attentien. I must also request you to bear in mind, that I intend my remarks to be applied chiefly to the middle country, the dry vegetable matter of whose high lands is less decomposable than that of the sea-board; and, therefore, must be used with more preparation for *instant crops.*

I have used dry leaves both for corn and cotton beneficially on sandy lands: how much more so then would they be on cold, stiff, moist soils, you may easily conceive. I have noticed that those leaves which produced the most *potash* or the most *gum,* are best. Not because of the greater proportion of ligneous matter in them, but, because such leaves are more readily decomposable than others, and their nutritious particles more soluble in water, in which form, the roots of plants consume them. The gum leaf, *for a present crop,* is the first, then the hickory, then the oak; and, lastly, pine trash. The leaves of the yellow pine cannot be used for a present crop, for they are *resinous,* and for nearly a year *insoluble* in *water;* or, in other words, indecomposable. Dry leaves yield one-seventh of themselves in manure, warm the earth in their act of decomposition, and, by opening fissures in it, admit air to the roots of plants. Yet, they are by no means so valuable as the turning under of green vegetable matter; because, *they cost more and do not afford the same nourishment.*

I selectod the best hand on my place, the driver himself, and ordered him to see how many loads of gum or oak leaves he could rake and cart in one day; and though the leaves were close at hand, the result was but five loads. He might have carted more, but the difficulty was in the filling of the cart. We have no utensil, and, indeed, it would be difficult to invent one, with which to load; so in "my parts," we have to use a basket, trample' the leaves in it, and then in the cart. With pine trash, we might use the ordinary fork, but the oak leaves fall through its prongs. I allow then that the driver, horse and cart, are worth fifty cents a day; I would not hire the same under one dollar. Now I am satisfied by experiment, that not less than one hundred cart loads of leaves to the acre will benefit cotton land, so as to make an *impression* on it; and to cart these, it would take twenty days, and therefore cost ten dollars.

Now, let us plant rye in September, to be turned under in June or July, *while in flower,* with a broadcast of peas; and these to be ploughed in before hard frost, for the spring culture.

One single-plough, planting an acre or more per day, is - -	$ 37½
Half bushel of rye to the acre, or less	50
One single-plough, to plant peas broadcast, - - - - -	37½
One bushel peas, or less, - -	1 00
One double-plough, to turn under pea stubble, - - - - -	62½
	$2 87½

$2.87 deducted from $10 leaves a balance of $7 12½ in favor of green vegetable matter. And this is not all, it has been discovered by chemical analysis, *that while green vegetable matter contains one-fourth af manure, dry vegetables contain but one-seventh.*

But let me take another view. Suppose that by some invention or improvement in the construction of the cart and fork, a hand might increase the number of loads carried in a day, could one have the smallest hope that he would accomplish twenty?—or if he did, that is, reduce the price of carting leaves to $2 87½ the acre, would it be as valuable as green vegetable matter, which turns out nearly double the quantity of manure? But it may be said, that one hundred cart loads of leaves, though containing *relatively* less, will turn out on account of bulk, or quantity, or weight, more manure than a crop of rye to the acre. To this I reply, that to produce the same effect on the acre as rye, the leaves must be double its *weight;* and, that they are not, you may decide, should you have ever seen the rye in flower, compared with one hundred cart loads of leaves strewed over an acre. The one may contain more bulk, but the former is heavier, and will afford more manure to the soil, independent of the pea stubble, the nutritious qualities of which have been too long known to be denied.

However, I need not inform you how much green vegetable matter is valued as a manure; the books are full of its praise, and none presents a greater number of proofs of its effects than Chaptal's. Whoever uses this manure should not forget *that green vegetable matter should be turned under while in flower, or before it goes to seed.*

Chaptal says, page 94—"In order fully to understand this doctrine, which appears to me of great importance to agriculture, it is necessary to consider the successive changes which take place in annual plants during their growth; first, they produce green leaves, which by coming in contact with the air, receive from it the principles of which I have spoken; subsequently the stalks increase in size and number, and are covered with numerous leaves, which absorb from the atmosphere a degree of nourishment suited to the increasing wants of the plants; the strength, fullness, and depth of hue of the leaves and the stalks, particularly of the latter, increase in proportion to the richness of the soil.

"This state continues till after the period of *flowering*, when a change, worthy of note, takes place; the roots dry up, the stalks wither, and change their colors; and when fructification is at length completed, both roots and stalks have become mere skeletons, which answer but little purpose either for nourishing animals, or manuring earth, During this period of vegetation, what becomes of the juices that were so abundant in the roots and stalks? *They have been consumed by the formation of the seeds.*"

To illustrate this, he gives the experiment of M. Matthieu de Dombasle. This gentleman on the 26th June, 1820, at their time of *flowering*, within a small space, selected forty wheat plants of equal size and strength, each having three stalks bearing heads; he pulled twenty of them, with all their roots, and left the rest to complete their fructification. Having carefully freed from earth the roots of those he had taken up, he cut the stalks two inches above the base, and dried separately the roots, and the stalks surmounted by their heads."

The roots and the portion of the stalks remaining with them, weighed, *grains*, - - - - - -	657
The stalks, heads, and leaves, "	1946.5
Total,	2603.5

On the 28th August, the time of harvest, he plucked up the twenty plants which had been left for seed, separating the roots, and cutting the stalks as of the first; of these, the weight was as follows:

	grains
Roots,	419.53
Straw, husks and beards,	1318 75
Grain,	1025.69
Total,	2763.97

"During these two months. the roots and the portions of stalks adhering to them, had lost	236.52
The stalks, heads and leaves had lost - - - -	624.67
Total loss,	862.19

"But as the seed weighed 1025.69 grains, the whole had increased in weight 160.47 grains, troy. From this experiment we may conclude, that the juices contained in plants, at the time of flowering, contributes to the formation of the grain in the proportion of $\frac{862}{1025}\frac{19}{69}$ and that the excess of the weight of the grain which is $\frac{160}{1025}\frac{47}{69}$, arises from the nourishment which the plant absorbs from the air or soil, during the two months of fructification."

From this experiment, we at once see the importance of turning under green crops while in flower, or before they go to seed. The effects of this process are then, 1st. Green matter returns to the soil nearly double that of stubble. 2d. By ploughing it under in flower, we have less grass to contend with the next spring. 3d. By exposing their roots to the sun or the coming frosts, many parasitic vegetables are destroyed, and decomposing, add something to the productiveness of the soil. 4th. By the destruction of roots and parasitic vegetables, less manure is taken from the soil during the winter. 5th. This matter decomposes, and is absorbed by the earth for *early* crops. 6th. The earth has not only received its first required ploughing, but is beneficially exposed to the winter frosts.

Your's, truly, C. R. C.

THE TEA-TREE.

From the Magazine of Horticulture.

Whilst waiting for the return of M. Guillemin, whom the government [of France] has sent to Brazil to procure seeds and plants of the *tea-tree*, we have only to express our wishes for his success. News was received in January from this gentleman. He states, that he observed in the garden at Rio Janeiro 12,000 plants in full bearing, and he was on the point of setting out for the province of St. Paul, where the number is still more considerable. He mentions that it succeeds exceedingly well in that country, and that half the tea consumed there proceeds from Brazil itself. He paid particular attention to the mode of preparing the leaves, and can now prepare them himself. Every thing leads us to suppose that the exertions of this gentleman will be crowned with success.

ON THE CULTIVATION OF MIGNONETTE FOR WINTER AND SPRING BLOOMING.

From the Magazine of Horticulture.

Probably no plant is more universally esteemed, and generally cultivated, than the mignonette. With the French and English gardeners it has been a favorite for a long time: in this country, however, it has not, until within a few years, been an object of common growth, nor is it at the present period so well known as it should be, except in the immediate vicinity of our large cities.

The mignonette is a native of Egypt, and was ntroduced into Britain about the year 1754; but it as become so generally diffused, both there and n France, that it has become in a degree natu-alized. It is not long since, that we read, in some oreign periodical, an account of its growing upon he walls of an old ruined chateau, in the neigh-orhood of Paris, springing out from every crevice vhere the seed could obtain a lodging place, and iterally covering the walls with its odorous blos-oms. In the Paris *Marchè aux Fleurs* thousands f pots of it are annually sold, and the window of he peasant, as well as the saloon of the opulent, s decorated through the season with pots of this avorite plant.

The mignonette is of remarkably simple growth n the open ground, and when once the seeds are lanted, it will retain possession of the soil, spring-ng up from self-sown seeds, and flowering early nd abundantly every season. Successive sowings n May and July will afford a constant supply of eat and compact plants, filled with flowers. In ich moist soil, the plants grow luxuriantly and pread out widely, but have a very scanty display f flowers: it is in a dry and rather hard soil that hey show themselves to the best advantage; for n such a situation they bloom early, and, without preading out their recumbent branches too far, are, t the same time, overloaded with blossoms. Those ultivators, therefore, who would have the plants n the greatest perfection, should select the driest pot in the garden, and sow the seeds thickly. But it is for the production of good plants for flow-ering in the winter, that we commenced these re-marks.

To bloom the mignonette in good perfection from he decay of the out-door plants in the autumn, un-il the return of the flowers in the spring, it is ne-essary that there should be two successive sow-ngs, viz. one in August, for blooming about Christ-mas, and another in September, for blooming from February till May.

Select for the purpose as many No. 2 pots as here are plants wanted; fill them with a compost nixed in about the following proportions, viz. one alf good light loam, one quarter leaf mould, and one quarter coarse sand. First give the pots a good drainage, for the health of the plants depends much on this; then fill them up to within half an nch of the rim, giving the pot a slight rap to ettle the surface, sow the seed thickly, and cover t with about an eighth of an inch of the same compost. A frame (an old cucumber bed will an-swer,) should then be ready to receive the pots; set hem so that they will not be far from the glass, and give a gentle watering; put on the sashes, and shade with a mat in the middle of the day, if the sun is two powerful, until the plants are well up. Give water cautiously and in small quantities, as the plants will damp off if they are kept too wet. Thin out the plants, leaving only three or four in a pot.

In the month of November or December, accor-ding to the mildness of the reason, the plants should be removed to the green-house or parlor: in the former place they should be placed on a shelf within two feet of the glass, and if nearer they will hrive better. Water should be given sparingly, and when the plants get up an inch or two, the tops of each should be pinched out in order to make them branch well. They will now grow slowly, and early in January will come into bloom. In the parlor they should be set as near the window sash as possible, and in the most airy part of the room.

When the plants have done blooming in the spring, they may be turned out into the border, where they will throw out new branches, and make good plants for bloom all the summer. We tried this method last spring, and at this moment the plants are now before us, flowering as profusely as seedlings of this year. When they are turned out, they should be cut down nearly to the soil.

The only requisites to be observed, in pot cul-ture, are a good drainage, light soil, and careful watering.

BEES.

From the Genesee Farmer.

Mr. Tucker—In the Monthly Genesee Farmer for August, I find an article on the subject of bees, from Doctor Henry Spencer, of Starkey, whose physiological and scientific attainments, justly entitle any remarks on the above subject, from his pen, to favor and regard; still, he has to some extent, as I conceive, fallen into the same error which he endeavors to correct in others. His remark that we should not attempt to give advice to others, where only one or two isolated cases have afforded us opportunities for observation, is very just.

He condemns the large hive recommended by L. N. of Windsor, Ohio, on the ground, as he alleges, of having made *numerous* experiments of the kind himself, all of which proved failures.

If he will examine personally the bee-houses in use among the farmers of Chenango, Broome, and Cortland counties, which are no other than large bee-hives, or houses built of brick, wood, or stone, from six to twelve feet square—in the upper part of which, a swarm of bees is placed on rods, crossing each other in various directions—and witness their progress in the multiplication of numbers, and of consequence a proportionate increase of honey, his prejudice against large hives will probably be diminished. I am well aware, as are those who use the large hives, that the bees do not increase in numbers, nor in the accumulation of honey, as fast after two or three years, as they would if treated in the usual way with a multiplicity of small hives or boxes; but it is a great tax upon the time of the farmer to be compelled to leave his work during the swarming season, (which to him is usually a very important one,) and perhaps a hand or two besides, sometimes several times a day, to secure the new swarms as they come out. Whereas, in the large hives or bee-houses, the bees continue to labor for years, as the writer of this has had the pleasure of witnessing, without any trouble to the owner—who goes at any season of the year and selects such quality of honey as he chooses; and when done in the season of flowers, which is the time usually selected, the bees immediately set to work, with renewed industry to supply the loss. And it is found that by frequently removing portions of the honey, the bees work as industriously as they do in smaller hives. The bees are not permitted to go out and in through holes or notches cut for that purpose, as is usually the case with small hives; but tubes are inserted into the ends or sides of the building near its top, through which they easily find egress and ingress. But the bee-moth cannot find its way in; it lights upon the building and examines every crevice, through which it tries to find its way to the honey; but never lights upon the *outer ends* of the tubes, which project some 12 or 15 inches from the building. The same kind of tubes, are used with advantage in the common small hives.

Dr. S. says, also—"A few months since, I saw an article in the Genesee Farmer from the pen of Dr. E. Barnes of Reading, which I fear is calculated to mislead. He says his neighbor buries his bees as he does his potatoes, and was told that they came out in the spring healthy and good condition."

I trust I have no desire to mislead others or do any thing calculated to lessen the profits, great as they are, of that useful insect the bee. One stubborn fact however, is worth a dozen pages of theory alone. The article to which the doctor refers, was communicated, as a method of wintering bees, which to me was entirely new, not however, until I had personally examined the mound, where Mr. Eggleston, the owner of the premises, had buried his bees.

Mr. E. from whom I derived my information, is a man whose character is, I believe, above reproach; and certainly it cannot be supposed he would have continued the practice for several successive years, of burying increased numbers of hives each year, if the doctor's fears are well founded.

Mr. E. says he was faithless at first; and therefore buried the first year only two or three hives; these coming out well in the spring, he was induced, I think he said, to bury thirteen the next fall season; and when I examined his apiary, which was in October, 1837, he had thirty-seven buried. He thinks if buried in a dry soil, they would rarely fail of coming out healthy and in good condition in the spring. I have taken measures to ascertain the further success of Mr. E. in this business, and intend to communicate to you the result.

Geneva, Aug, 22, 1839. E. Barnes.

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Mr. Tucker—Since mailing to you my letter of the 22d inst. in reply to the remarks of Dr. Spencer on the management of bees, I have received the inclosed from Doctor Andrews, which I beg leave to present for publication, in connection with my last, as it so fully confirms the former statement I made on this subject from information derived from Mr. Eggleston. E. Barnes.

Geneva, Aug. 23, 1839.

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Wintering Bees.

Mr. Tucker—Agreeably to your request, I called on Mr. Eggleston, and obtained from him the following statement of his method of wintering bees, and the success attending it.

In the fall of 1837, he buried 30 or more hives, and the following spring they were taken out without the loss of any. In 1838 he buried 10 hives, with the same success, but lost 7 or 8 hives of bees that stood in his bee-house through the winter. He says that he finds very few, or no dead bees under his hives that are buried, and that they winter on much less honey than when left in the house; some small swarms have lost but 3 lbs. in weight in wintering, and the largest but 10 lb. He has buried his bees or some of them, each year, for 4 years past, and has not lost a swarm that was buried, and shall hereafter bury all, that he intends to winter; he has now about 40 swarms. Another fact—those that are buried do much better, and swarm much earlier in the spring.

Mr. Eggleston's method of burying his bees, is to dig a shallow trench in the ground, long enough to set the number of hives he wishes to bury, with a gentle slope in the trench, to carry off the water if there should any collect; and then place the hives in the trench, raised a little from the ground, by a small stone under each corner of each hive, then covers them with straw and lastly with dirt, to use his expression, as you would a pile of potatoes, so deep as not to freeze under the hives.

As to the success of Mr. Eggleston in preserving bees, as described above, there can be no doubt, as it is known to all his neighbors, who (if necessary) will certify to the facts as stated.

Yours respectfully,
Anson Andrews.

Reading, August 20, 1839.

DIFFERENT MODES OF PRESERVING AND PREPARING TOMATOES FOR THE TABLE.

From the American Farmer.

Canonsburg, August 16*th*, 1839.

Mr. J. S. Skinner—As the season of tomatoes is at hand. I will send a few recipes for preserving them for winter use.

Take tomatoes, say half a peck, when ripe, but not too soft, skin them and cut them in two, leaving the seeds or not as you like; lay them on a dish, (I do not mash them;) then take two quarts of strong vinegar, put one table-spoonful of allspice, the same of powdered ginger, the same of cloves, the same of salt, half a table-spoonful good Cayenne pepper; put all (except the tomatoes) in the vinegar; boil it in a very clean brass or bell-metal kettle for about half hour—then strain it through a sieve, put it again on a slow fire, and and when it begins to boil, put in some *of the tomatoes*, but do not crowd them. When *they* look clear, take them out carefully with a skimmer, and lay them on a dish; do so until you have them all done, and when cold, put them in a glass or white earthern jar, with the vinegar in which *they* were boiled. Dip writing paper in brandy or strong vinegar, and put over them: cover them tight, and put in a cool dry place. It is excellent with fresh, or any other kind of meat.

Another—Take tomatoes when ripe, skin them, cut them in two, lay them on large dishes, put them in the sun to dry, turn them often, and when sufficiently dried in the sun, put them in a dry place. They should be exposed to the sun after a damp spell of weather. When stewed or cooked in any way, they are almost as good as when first taken from the vines.

Another and easy mode of keeping tomatoes—Make a strong pickle of salt and water that will bear an egg, make it cold, strain it into a crock, or small keg; take ripe tomatoes, fill the crock or keg, pour the pickle on them, and cover it with a thin stone to keep them under the pickle. In the winter when you want some for use, put them in cold water the night before, and in the morning change the water until they are as fresh you as want them. Then cook them, or eat them raw with vinegar, pepper and salt.

A cheap and excellent dish—Take cold cooked meat of any kind, chop it fine, season with salt, pepper, and a little butter and spice if you like. Then take stale bread, say one-third to two of meat, soak it in milk or water, taking care not to make it too wet; then take four or six large ripe tomatoes, skin them,chop them fine, put them with the meat and bread, mix them well together, put in a deep dish, and bake it in a slow oven on a stove,for one hour; eat with gravy or not as you like.

Another.—Take cold cooked meat, chop fine, season with pepper, salt, and butter, (if the meat is not fat); boil some potatoes, mash them, put one-third to two of the meat, mix well together, put in a deep dish, bake slow three-quarters of an hour.

In your large cities there is a great deal of provision thrown away by cooks that might be made into wholesome and palatable dishes. All the above dishes I have made. If our housewives would look more into their larders, they might save their husbands some dollars in the course of the year. As this hint comes from an old lady, I hope my fair countrywomen will not take it amiss, but profit thereby; and to make up, I will give another recipe.

To preserve tomotoes in sugar, take them when ripe, but not too soft, skin and cut them in two, taking out the seeds; take, for one pound of tomatoes, three-quarters of a pound of sugar, loaf or brown; loaf is best to keep them. First take two fresh lemons, cut them in thin slices, put them in one quart of water, boil them until soft, strain the seeds out, add the sugar, let it boil for half an hour slowly, then put in as many tomatoes as not to crowd them. Let them boil until clear, then take them out carefully with a skimmer, lay them on a large dish, then put more in,and boil them the same; do so until all are done. When cold, put them in glass jars. If there is not syrup enough to cover them, make a little more. When all is cold, dip white writing paper in brandy, cover them with it, put double paper over them, tie them tight, and keep them in a cool dry place.

I hope that your young housewives will endeavor to be the *mothers* of invention, and have the credit of making their own recipes and cookery.

If you think the above recipes worthy a corner in the Ladies' Department of your useful and valuable periodical, by so placing them you will oblige

E. M. P. DARBY.

For the Farmers' Register.

ON THE MANURING OF ARABLE LANDS BY THEIR OWN VEGETABLE GROWTH.—ROTATIONS OF CROPS.

No. I.

On green manuring, and the advantages of the system in cleansing land of weeds, and destroying insects.

The ploughing in of green crops of annuals, to manure the land on which they grow, has long been recommended by agricultural writers, and has often been practiced to small extent, and under particular circumstances. I am not aware that any experiments have ever been made sufficiently accurate to test the absolute or comparative value of this mode of manuring; and, even without experiment, it has never been made a regular and continuous practice any where. This neglect of the practice seems to offer a strong indication of its want of utility, or economy. But on the other hand, it should be observed that there were strong objections to the system in England, on the score of expense in rent, and in this country, of expense in labor; and in the absence of all certain and unquestionable results of experiment and practice, these certain and heavy expenses were to be expected to out-weigh the prospective and conjectural profits. Clover, only, has been turned in to great extent, in its green state—or common weeds, in the absence of clover; but this was done not so much to gain the manure, as to prepare the land for wheat. And great as has been the profit of this manuring by green clover, the particular share of benefit to the next crop, and to the soil, due to that cause alone, has never been estimated, much less ascertained by proper experiments.

Col. John Taylor was the first who, both by precept and example, established the practice of manuring the fields by their own cover of artificial grass or of natural weeds. This recommendation was most opportune to the then circumstances of the agriculture of Virginia, and that, still more than the reasoning and example of the distinguished author, caused early and extended applications of his "inclosing," or non-grazing system, for improvement. The inducing circumstances were several. Most of the old lands in lower Virginia, were then cultivated in what was called the "three-shift" system—or corn, wheat, and a year of rest, (if rest it could be called,) under close grazing; and nothing was needed but to forbid all grazing of a particular field, or of all the fields of a farm, to establish at once the "inclosing system." Then, the amount of the rubbish natural growth on poor fields was worth so little to the live-stock, that the loss on that score could not be much; and the urgent wants of the poor land for some help, and the hopelessness of ever supplying that want by manure from the barn-yard and stock-pens, served to present the other as the only resource, for general or extensive benefit. Again, there was something very inviting in the idea of manuring the largest fields by merely *letting them alone* for one year, or for two years under the author's extended and approved rotation. Those who before had not manured five acres a year, by means of all other vegetable materials used, might then manure 100 or 200 acres; and if the effects of the manure, should be worth but little, its cost would be still less.

But the vegetable manure thus applied and recommended by Col. Taylor, was not *green*, but *dry*; and he used at least plausible and ingenious arguments to sustain his novel position, that vegetables in their dry state were better for manure than if ploughed under when green. This opinion, and the circumstances of his and the other usual rotations of the country, served to withdraw all his followers from the class of applyers of *green crops* as manure; though Taylor, notwithstanding this limitation imposed by himself, still must stand, from the extent of his practice and influence, at the head of the school of natural manuring by the vegetable growth of the land.

Up to the mark to which the lands are capable of being enriched by vegetable manures alone, (and of the fixing which limit I have fully treated elsewhere,) there can be no means of manuring poor lands so cheap as the non-grazing plan; nor can any be so generally effective and beneficial over a great extent of a previously impoverished country. But besides the limitation imposed, by the nature of the soil, to continued improvement by these means alone, (and by any putrescent manures alone,) there are great inconveniences attending the "inclosing system," and which I can well appreciate, having pursued that system since 1814; rigorously for the first twelve years, and partially afterwards.

The discussion of the comparative enriching values of vegetables when turned in green, or matured and dry, we pass by for the present. The nutritive value of the growth when dry, whether greater or less, would be satisfactory; and the plan of ploughing in during winter, instead of in summer or early autumn, when to prepare for corn, or any other spring crop, is further recommended by several considerations of economy and fitness. But the great objection to that plan, is, that the seeds of all weeds are matured, and planted when ploughed in; that shrubs and bushes are encouraged to grow by protection from cattle, and increased ten-fold in number and size by the long rest of two and a half years; and that the growth and long undisturbed state of the vegetable cover seems to nourish, breed, and protect insects and other vermin, which prey upon the grain crops when the land comes under tillage. And even if clover can be made in some measure to take the place of, and to exclude, natural weeds, the evil of noxious weeds is but partially diminished, and that of insects probably much increased. And the longer the system is continued, and the more the land is thereby filled with vegetable matter, and enriched, the greater do the evils mentioned become; and the more do they increase the farmers' labors and risks, and frequently cause losses of product equal to all the gain from the new fertility produced. In every round of the rotation, it is found that the field thus improved is more foul with its growth, and more troublesome to prepare for cultivation; and that the grain crops are more infested by the weeds of which all the seeds have been so long continually protected and annually sown; and the cultivated crops, in every stage, from depositing their seeds to gathering the product, are the more and more preyed upon by the myriads of insects of various kinds thus nourished and sheltered. Every follower of this rule has found great and still growing disadvantages of these kinds; and the most successful "inclosing" improver can scarcely fail to have foul fields, foul products, and his labors increased, and his increase of product often diminished, by hosts of vegetable and animal plagues. Under such circumstances, neat management and perfect operations are impossible; and the cultivator will necessarily be a slovenly farmer, even if he be an improver of his land, and of his income.

When a soil was naturally well constituted, or has been made so by calcareous manures, so as to produce good clover, then the above-mentioned evils of the system might be mitigated in one or more ways. If the clover should be cleanly mowed, for green-food, or early for hay, then the cheat, spelt, cockle, and numerous other annual weeds, would be cut off before their forming seeds, and their reproduction be in some measure checked. And if then ploughed in for wheat, in August or Septem- (a departure however from Taylor's system,) more weeds might be destroyed, and the food and winter protection of cut-worms and other insects taken away, and their depredations on the next crop thereby prevented, or restrained. But these deviations from Taylor's rotation, even if approved and desired, could be availed of but in small measure, compared to the extent of all the arable land.

The excess of the advantage over the disadvantages of Taylor's "inclosing system" is greater in proportion to the poverty of the land, and the scantiness of its vegetable cover; and the disadvantages increase, and preponderate, in proportion to the subsequent increase of fertility. I therefore not only advocate its adoption, but its being strictly maintained, on all poor and greatly exhausted lands; but would as much recommend its being substituted by other modes of manuring, and other treatment, when the land is already, or after being made, moderately rich. The great recommendation of manuring by "inclosing" on poor lands, is the cheapness of the mode of improvement, which there truly costs nothing to apply, and avail of fully. But on rich land, the loss of the value of the grass would be important, and the nourishing of rubbish vegetable growth, and noxious vermin, would more than counterbalance the increase of fertility.

The evils of this system, as well as its benefits, I know by long experience. But of the substitutes which will be treated of in the following remarks, I have no practical experience, know of not one accurate experiment, and have only reason, and theoretical views, from which to receive impressions.

The main object of leaving vegetables to grow and then to decay on, or to be ploughed into the land, is to *manure* and fertilize. But this should not be all the object. A secondary, and yet very important one should be, to prepare the land the better for subsequent tillage, and also to prevent or destroy the growth of noxious plants and animals. Every particular kind of vegetable serves as food to nourish, and to encourage the increase of some particular kinds of insects; and the longer the growth remains undisturbed, the more the feeding insects are increased. Let their supply be totally cut off, when needed for food, by being ploughed under and killed, and the worms and wingless insects which were there fed, even though they be in countless myriads, must perish, and themselves help to manure the ground, instead of being kept to devour its future fruits. To effect any such object, the ploughing in of the cover must be in warm weather, and not when cold has rendered insect life dormant.

If the vegetable cover be ploughed in so late, or so imperfectly, as not to destroy depredating insects, because of their not then requiring food, or because the food is not enough destroyed, then their numbers are not materially diminished, nor their future depredations checked. And further, if the next planted crop be suitable for their food, as that which first nourished them, then the succeeding crop, in its young and tender state, can scarcely fail to receive great injury. This is strikingly exemplified in the damages sustained by young corn from the cut-worm, on lands not grazed or mowed, and especially after clover, and the vegetable matter not ploughed under until late in winter. The eggs of the parent stock of insects, which had lived upon the clover, are not in such cases killed by being early exposed to cold, or by being deeply buried in ploughing, and the worms hatch just in time to be fed upon the young corn; and if their change to the chrysalis state did not stop their eating, a crop of corn could not possibly be made to stand under this very common infliction. As it is, the corn is eaten, and replanted, over and over again, until the worms no longer eat, and the later plants are suffered to grow.

Now, if instead of keeping the clover as a seed-bed for cut-worms, it had been ploughed under in August, and thus a change suddenly made from a heavy cover of grass, to a naked surface, offering neither food nor shelter—the greater part of the insects must have perished—and perhaps even field rats and mice might have been thinned, or driven off. In particular, the mother fly of the destructive cut-worm, would have found there no suitable place to deposite her eggs—or if earlier deposited, their new and unnatural position would probably have destroyed them.

This is presented as an illustration of one of the great benefits which may be secured, and which is generally lost to improvers by "inclosing." As to the propriety of following clover by wheat rather than corn, as a general feature of the rotation, that must depend upon other and more important considerations.

For the purpose of destroying noxious plants and insects, the more frequently during a rotation the vegetable cover can be changed, or destroyed by ploughing under, and then renewed in some other kind, the more will that purpose be furthered. With each successive coat, if effectually turned in and covered by the plough, and the seams closed by the harrow, there must perish all the unwinged insects which preyed on that crop; and if any should linger and remain alive so long, they will not be likely to thrive on the next crop, of a totally different kind.

If then the main objects were to clear the land of insects and keep down weeds and vegetable plagues, I think these ends would be best met by ploughing well the corn-fields, as early as the corn can be safely cut up, and shocked or removed, and sowing rye, either immediately, for forward growth, or after some interval, to starve insects; and next spring, when the rye is in flower, to plough it under, close the seams well by immediate harrowing, and sow field-peas broad-cast, of some kind most productive in vines, which again are to be ploughed under in autumn, and wheat then sown. It would seem, that, the ordinary tillage of land in corn, and ploughing for and sowing in rye, the ploughing under that crop, say about the beginning of May, the thick and smothering after-cover of peas, and that cover being also well buried by ploughing and harrowing, would all form so many quick changes and dissimilar conditions of the land, that few enemies, either vegetable or animal, could escape destruction. For the shade and growing of the pea crop (for example) might be as injurious to some of these pests, as a continued operation of the plough. Such indeed there is good reason to believe is the case with the weed called the partridge pea, which is the one most absolutely destructive of the wheat crop; and which seems starved out, and disappears for the time, if field-peas be grown thickly among the corn preceding the wheat. I infer, that if a regular system of green manuring, by crops of annuals, is at all profitable on the score of improvement to the land, or preparation for the succeeding grain crop, that an additional and very important advantage will be gained in the remarkable cleanness of the fields, and the greater security of the crops from weeds and insects. In addition, therefore, to the other supposed and understood advantages of alternating crops, and the superiority of a long and varied rotation to a short and limited one—and still more to the continued recurrence of the same crop—I think that a great, though unsuspected advantage has been in the frequent alterations, and violent changes of condition, proving destructive to vegetable and animal depredators.

Admitting the soundness of these views, still there will be much ground to exercise choice and judgment in selecting plants for green crops, and fixing their order of succession. It would be presumptuous, with the admitted want of experience, for me to prescribe any precise rule or rotation. But I would, in the choice, aim to keep in view the great objects of fertilizing and cleaning the land. For the first object alone, leguminous plants, or all of the pea-tribe (of which red-clover is one,) are better than any others, because, by means of their broad leaves, they draw much more sustenance from the atmosphere than from the soil, and of course give most, by their death, to the soil. For the other object, of cleansing the soil, the more frequent the crops, and the more violent the changes of the kind of crops, and the condition of the soil, so much the better.

Col. Taylor was altogether unacquainted with chemistry and vegetable physiology, and his want of knowledge of these sciences, and of their bearing on agriculture, caused him to fall into, and to utter, some remarkable errors. But by the mere grasp of his strong mind and reasoning power, he arrived correctly at the most important conclusion, the correctness of which can be abundantly proved by the lights which chemistry and vegetable physiology might have furnished to him. He speaks of the atmosphere as the great and inexhaustible reservoir of manure for the earth; and considers growing plants as feeding indirectly on air, when sustained immediately by vegetable manures. He was entirely right in his conclusion, though it was not reached by the proper course of reasoning, nor maintained on proper ground. Growing vegetables draw, by means of their leaves, a large portion of their sustenance directly from the atmosphere; and by their roots, they take up the solutions of vegetable matter, returned to the soil, (and then acting as manure,) and which had formerly, when alive, also drawn directly from the atmosphere the greater part of its sustenance. Thus, directly or indirectly, nearly all that serves to form vegetables, comes from the air, and is nothing more than new combinations of the constituent parts of the atmosphere. All that can be converted to charcoal, (and that is the frame-work, and fills the whole bulk of every tree and plant,) was formed of the carbonic acid absorbed by the leaves; and all the balance of the plant is composed of oxygen and hydrogen, the two elementary bodies which by their combination form water. All of the small remainder, not thus derived solely from air and water, are the few earthy and saline parts, which are left as ashes after burning, and which form a very small portion of the entire weight of the plants.

But though plants draw so large a portion of their support from the atmosphere, they must be placed in good land, or be nourished by manure, to enable them to profit well by the supply of atmospheric food. If there was nothing in the earth to make a plant grow, it could draw nothing from the atmosphere. If it had barely strength lent it from the earth to make a small developement of growth, it might, it is true, derive three times as much from the air, and yet be still but a poor product. But let its power from the earth be increased four-fold, and in the same ratio, the atmosphere would raise the product $(1\times3=3\times4=)$ 12 times more than its first capacity. Thus the more the land is enriched, in a much greater proportion is the crop enabled to draw benefit and support from the atmosphere. Hence, in one respect, the great profit of giving manure to land. But there is another reason why green crops for manure should not be raised and ploughed under, except there is already enough strength in the land to make a heavy growth. The expense of seed, for a manuring crop, will not vary materially, whether the land be able to produce one or ten tons of the green manure to the acre; nor will the labor of seeding and ploughing under be of much greater difference. Thus if the seed and labor on an acre of the poorest land would amount to $4, it would probably not exceed $6 on the richest, requiring such aid; and yet if the increased product of the first year gained on the poorest, was of the value of $1, it might be $6 on the richest land.

Clover is the most valuable of all mowing vegetables, not only because of its sharing the property and power of all the pea-tribe to draw sustenance largely from the air, but because its long tap-root also draws both moisture and food from a great depth in the earth. Its being a biennial plant also gives it greater product and enriching power from one seeding, than any annual plant has. But, on the other hand, its long occupancy of the ground gives opportunity for weeds and insects to multiply.

In a continuation of remarks upon this general subject, will be considered, 1st, the other grounds for choice between ploughing in vegetables when green, or after being matured and dry—and, 2ndly, the advantages and disadvantages of different schemes of rotations of crops, as tested by the views here set forth, as well as by the received general principles to which it is desirable that rotations should conform, as nearly as circumstances may permit.

E. R.

PRIVATE CORRESPONDENCE, AND REMARKS ON PRIVATE MATTERS.

To the Editor of the Farmers' Register.

"*Columbus, Ga., Sept. 5*, 1839.

"By the request of John L. Lewis, I inform you that he does not take the Farmers' Register from the office, and says he does not want it, and further states that it was not sent to him by his request, so you will please stop it.

"J. A. Slaton, Ast. P. M."

We have been tempted to publish the foregoing notice, as it presents a sample of the mode in which sundry of our accounts with subscribers and debtors are *settled*. From the mere words of the above letter, a reader would infer that the Farmers' Register had been obtruded upon Mr. Lewis, by the publisher, without his order, or authority; and that he had given this notice, as soon as he was assured of the circumstance, by successive numbers being directed to his address. But such has never been our mode of seeking support, and we never have, without being so directed by some one supposed to be authorized, placed a name upon our subscription list, or sent, in continuation, our publication to any one, except as a present. Mr. Lewis' subscription was commenced for the fifth volume, which volume was *paid for* when the order was given, and *therefore*, we presume, by some person having authority. More than two years have since passed, and two more years' subscription are now due, ($10,) and after the issue of the 8th number of the second of these volumes not paid for, we received the above and *first notice of any kind*, from (or for) Mr. Lewis. It is not unlikely (though not so intimated) that he may at some former time, have requested his post-master to direct the discontinuance of a work to which he attached so little value; but if so, his order never was received, if indeed sent, and of course could not be known or obeyed. If such neglect of his request occurred, it was not our fault, and he is not the less indebted for the two volumes since sent to him—and, according to the conditions, for every future volume which we might choose to send, notwithstanding the present notice to discontinue, which has no validity, until all arrears due are paid. But *our settlement* of this claim will be as summary as that of Mr. Lewis, though less profitable to our interests. We simply erase his name from our list, and submit to the loss already incurred. We have no means of enforcing our *most just* and clearest claims against subscribers, and *cannot but* admit the truth, that against those subscribers who neglect or refuse to pay what they owe for subscriptions, we have no redress. We can only endeavor to lessen the number of non-paying "patrons," by erasing the names of all subscriptions long in arrear. We have but to beg of those who have merely fallen in arrear, not from intention, but because of inattention, or a common habit of procrastination, not to compel us to confound them with those the loss of whose names and subscriptions is a *gain* to the publication.

There is another class of *discontinuances* which are no less common, and of which the following letter from a post-master presents an example.

"*Mount Laurel, Va.* 3rd *April*, 1839.

Mr. Stephen Cronin, a subscriber to the Farmers' Register, at this office, has removed from this neighborhood and gone to live some where near Lynchburg. He requests that the Register will be discontinued to him. The February number is now in my office, which he refuses to take out, and will be disposed of as you may direct."

When this notice was written, Mr. Cronin (who also had paid for vol. 5,) owed for vol. 6, completed, and for vol. 7 then in progress. A statement of his account was forthwith sent to his new address, Lynchburg, which has remained unanswered, and the debt unpaid, to this time.

THE FLORIDA KEYS, AND THE TROPICAL PLANT NURSERY.

To the Editor of the Farmers' Register.

Indian Key, T. F., 4th July, 1839.

I have the pleasure to transmit to you copies of the correspondence between the trustees of the Tropical Plant Company and the Honorable Secretary of the Navy, in relation to the introduction and preservation of especially the fibrous leaved plants.* You will perceive that the reply of the Hon. J. K. Paulding is as satisfactory as was expected; but when I reflect that under the successive secretaries of the navy during twelve years, not a single fibrous leaved plant has yet been brought from Mexico by our national vessels, which have returned from the Mexican sea every year; and that the heads of our departments generally retain their offices so short a period that they cannot carry into execution their own designs; and above all, when I consider how easily their express instructions are often evaded or thwarted by their distant agents, I cannot help fearing that many years will yet elapse before a cargo of living plants shall be transported in a national vessel to any portion of Tropical Florida.

In selecting the site of the preparatory nursery of tropical plants, the trustees were influenced by several considerations. 1st. Its vicinity to Indian Key. 2ndly. Its immediate proximity to the celebrated pits of water on Lower Matacumba. 3rd. Its central position along the reef; and 4th, the facility and safety of intercourse between it and the mainland. Indian Key itself is a beautiful little island, highly improved, and is both the most eastwardly settlement on the reef, and the village nearest to the mainland. The only other villages on these islands are those at Key Vacas and Key West, respectively 30 and 80 miles to the south-west. Indeed Key West itself is so remote from the peninsula that it may be geographically considered rather an appendage to Cuba than to Florida; north-eastwardly to Cape Florida, and thence northwardly 300 miles towards St. Augustine, there is not probably settled a single family. At the commencement of hostilities, there were many families in the vicinity of Cape Florida and of New River; but on the murder of Cobley's family by the Indians, they all fled from the mainland and many went to Key West, where they still reside in anxious expectation for peace to return. As then Indian Key was the only settled islet near the centre of the reef, the trustees were obliged to locate the nursery in its vicinity; and hence I proceeded to this village on the 25th December last, notwithstanding the written opinion of the department of war, that it would be unsafe to have my family here during the last winter.

As, however, I did not receive that opinion until my family were on the point of embarking from New York, I came on with the belief that in case of attack we could escape to Key West, and thence, if necessary, to the Havanna. During five months after my arrival, Indian fires were distinctly visible every week on the islands five to ten miles north; but these were represented to the females to be probably the lights of fires kindled by turtlers or fishermen. When the Indians shall be removed, the advantage of being under the *protection* of the population of Indian Key will also cease; yet other benefits resulting from its vicinity will always continue.

Under the second head you will at once appreciate the great advantages for a nursery of proximity to the only pits of water on the whole Florida reef, in a climate where moisture is the equivalent to manure. But as it is the only watering place for the wreckers, from Cape Florida to the Tortugas islands, you perceive that this circumstance also will be favorable to the nursery, both by facilitating intercourse, and exciting observation and inquiry. It is true that the sailors will occasionally do some damage; but some losses must be expected under all circumstances. In the wrecking vessels there are frequently intelligent invalids, who are cruising for the benefit of their health; and their curiosity will prompt them to examine the preparatory nursery; and all that it is requisite to ensure its success, is, that it should be seen by many persons when it shall be filled with valuable plants, adapted to flourish in the most arid soils.

Under the third head, by looking at a chart or map of this reef, you will at once perceive that Lower Matacumba is about midway between Cape Florida at the north-east extremity, and the Tortugas Keys, at the south-west extremity of the chain. The nursery is in full view of all vessels passing through the gulf along the reef, not more than 5 or 6 miles distant. From the seed and tool house at the garden, I have frequently seen five or six vessels at one view, and 15 to 20 in the course of the day. The entry from the gulf, inside of the reef, is several miles wide, and the water at the least 18 feet deep to within two or three miles at most from Matacumba. But the great advantage to the future planting and population of the reef resulting from the central location of the nursery, depends on the fact, that all the Keys are composed of the same single element of lime, and consequently that all the plants which flourish in the nursery will be equally adapted to flourish on all the other islands to which they can be extended in each direction with equal facility. As these will embrace all the valuable plants which are usefully propagated in the steril Bahamas, they can be hence best brought to this central site, and thence distributed over the equally arid Florida Keys. Our national vessels can also approach within three miles of the nursery, and discharge the plants they may bring, without a day's delay in the course of their return voyage home. Were it not for the obstacles interposed by the government of the United States, in confining a single monopolizing port of entry to Key West, at this very moment the nursery might have been filled by a cargo of living plants, imported direct from the Bahamas in private vessels to Matacumba. But so long as vessels for and from the Bahamas are obliged to clear and enter at Key West, 80 miles to the westward of the nursery, so long will it be impossible to get even from that district, in *safety*, a cargo of living plants, at the only appropriate time each year—the beginning of the rainy season.

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* This correspondence was received much earlier than this letter, and therefore appeared first, in a previous number of the Farmers' Register.—Ed.

Under the fourth head, you will perceive that Matacumba is within 25 miles of Cape Sable, and in the shortest direction due north not above 20 miles from the main land. Behind this outside range of islands the sea is very shallow to the main coast, many portions of it being dry at low water, and even in the deepest holes or channels not exceeding fifteen feet. The channels which run in irregular gullies through this shallow sheet of water will one day be the routes of small steamboats, which will ply between the keys and main land. This shallow sea, being sheltered by the outer islands, is perfectly safe for the smallest boats; and the Indians before the war generally resorted to Indian Key in their small canoes. Hence, comfortable flat bottomed boats can be constructed to carry on a safe intercourse between the islands and the south shore of the peninsula; and Mr. Howe has already a suitable one constructed for this very purpose, which is now in the employ of government, under the command of Col. Harney. The result of the whole is, that the preparatory nursery is conveniently situated for an intermediate depot of plants for, and from, the permanent nursery to be established on the main land.

Very respectfully,
Your obedient servant,
H. PERRINE,
Superintendent of T. P. C.

P. S. Can any person rationally object to the following propositions?

1st. Shipwrecked persons and property should have the *legal* as well as the moral right to seek the nearest and most convenient spot for safety.

2nd. Agricultural persons and plants should also have the *legal* as well as the moral right to avail themselves of every natural facility for populating and cultivating every section of our country.

3rd. That as a vast majority of the numerous wrecks along the Florida Reef occur at points between Cape Sable and Cape Florida, that hence ports of entry should be established at least every 50 or 60 miles, for the accommodation of wrecked persons and property alone.

4th. That as the highest considerations of national advantage require the speedy introduction and cultivation of tropical plants in Southern Florida, the ports of entry should be made for that purpose alone.

5th. That at all events these combined considerations require that congress should immediately establish two or more ports of entry at or near the southern extremities of the peninsula, and thus diminish the governmental obstacles hitherto interposed to the speedy salvage of wrecked persons and property, and to the speedy population and cultivation of Tropical Florida.

P. S.—By a transient conveyance from Key West, your numbers for April and May were received last evening, and were read by me every hour of the whole sleepless night. Your indefatigable industry, your enthusiastic zeal, your patriotic spirit, and your fearless language, all combine to ensure success to any enterprise in which your feelings may be enlisted. Your work on calcareous manures, received in May last, has opened to me a new world of observation, and of inquiry. The composition of that work alone must have required many years of laborious study; and indeed the subject of it is worthy of the dedication of the entire life of an enlightened agriculturist. But to appreciate that volume completely, it must be thoroughly studied, and to that pleasant labor shall hereafter be devoted many of my leisure hours. If possible, I would devote to it several hours every day, until I could furnish to you all the important facts relative to the growth of plants on this exclusively calcareous reef. Like the '*Bourgeois Gentilhomme*' of Moliere, who only discovered in his 40th year that he had been speaking *prose* all his life, so the people of this reef never reflected that they had been living in a tropical climate all their days, until they read my writings; and I myself frankly confess that I never duly reflected on the peculiarity of these exclusively calcareous Keys until I read your books. Yet, *a priori*, it would seem as little strange to expect that trees should furnish in beds of exclusively animal or vegetable manures, as that they should grow on these islands of exclusively mineral manure.

I am moreover exceedingly rejoiced that next to *lime* you appear to appreciate *water* as manure, and that you are hence republishing every thing showing the importance of water to vegetation—and especially the practical utility of irrigation in warm climates, where as Young says of Spain, "the *soil* is the least object, the sun and *water* do the whole," and that the effect of water upon the poorest land "infinitely exceeds that of the very richest manures that can be spread upon any land." In your Farmer's Register for November 1835, which you had the kindness to send me, there is no exaggeration of "the superior advantages in warm regions to be derived from flooding lands," contained in the translated article from page 484 to 490. When I shall have seen all that you may have published on this subject in your Register, should I find that I still possess some facts in store, worth republishing, they shall be at your disposal.

H. P.

SUCCESSIVE CROPS OF COCOONS IN TROPICAL FLORIDA.

To the Editor of the Farmers' Register.

While at Princeton, New Jersey, during the last week in July 1838, Judge Vandyke of that neighborhood presented me four strips of paper, each containing the eggs of a single moth. The papers were labelled as follows: No. 1, white cocoon of two-crop worm. 2nd, sulphur colored cocoon, or old Connecticut. 3rd, hybrid of male No. 1, and female No. 2. 4th, hybrid of female No. 1, and male No. 2. These silk-worms' eggs I immediately despatched by mail to the postmaster at this islet, but after my arrival here, on the 25th Decemer, I forgot to make any inquiries concerning hem until the 27th March, last. Mr. Howe then informed me that he had hung them up in his celar, and had not seen them in many weeks. That cellar, however, is the basement and *bathing* apartment of the house in which I reside, *which is built over the sea*, and a most luxurious enjoyment does it daily, and even nightly, afford to my family. On examining the papers, I found that many eggs had already hatched, but in the followng order: No. 3, the most. No. 2, the next. No. 4, the third, and No. 1, the least. Of No. 1, the eggs continued to hatch from 29th March, to 30th May, at five intervals of one day each, one of 2, one of 3, one of 6, one of 9, and one interval of 10 days. Of No. 2, the eggs continued to hatch from 27th March, to 7th April, at five intervals of one day, and two of 2 days each. Of No. 3, the eggs continued to hatch from the 27th March, to the th May, at seventeen intervals of 1 day, seven of , and three of 3 days. Of No. 4, the eggs continued to hatch from 29th March to 30th of April, at ix intervals of one day, four of 2, two of 3, one of , and one of 7 days. As the girl who kept the ecord of No. 1, was sick part of the time, the reord is imperfectly kept, and hence, with regard to he period of making the cocoons, I barely find that one worm ascended to spin on the 24th April, or the 27th day from hatching. Of No. 2, the worms ascended to spin from April 23rd to April 29th, at an average period of 28 days. Of No. 3, the worms ascended from April 23rd to May 6th, mostly on he 28th day. Of the hybrid No. 3, it was remarked that several worms were white, but all the cocoons were yellow; and of hybrid No. 4, that hat none of the worms were *white*, but that *all* he cocoons were *white*. The period of the issue of moths from the cocoons of No. 1, was not noted. Of No. 2, the period noted were May 7th, 8th and th, or the 14th day after the ascent to spin. Of No. 3, the only periods noted were May 7th and th, or the 14th after the ascent of each. Of No. , the period cannot be now ascertained. As he records were kept by my wife and children, and it was their first essay, of course many omisions occurred, which will render my abridgement mperfect. The only account of the eggs laid, were those of two moths of No. 3, eggs laid on he 9th May, and of one moth laid the 14th May. There was also a particular record of the fact, that from a worm of No. 3, which ascended to spin on he 24th April, from its cocoon issued a female hybrid which coupled with a male of No. 2, or sulphur colored cocoon worms, and that the resulting *ribrid*, or *quateroon* eggs spontaneously hatched nto worms the 20th May. On that morning 311 worms were found hatched; on the 21st, 53 more worms were found, and 36 eggs remained unhatched; and this day's worms and eggs were preented to a neighbor. These quateroon worms of the 21st May, were fed on the leaves of the morus multicaulis. On the 25th May the next record is made of the hatching of eggs. Thus hybrid No. 3, a white worm, ascended to spin, May 1st; from the cocoon issued a female moth, 12th, and coupled with a male moth from a *brown* worm of the same No. 3. Eggs laid 12th, and eggs hatched 25th May; nearly all hatched on the same day. These worms were fed on the leaves of he morus rubra; but these were the only eggs that have hatched of all laid by No. 1, 2, 3 and 4, in the month of July. Now, I will briefly add that the quateroon worms, hatched on the 30th May, did so well, that on my return from a visit to Key West, I found that several had begun to spin their cocoons on the 9th June, and that all had ascended on the 12th June.

As my boy of 12 years old attended the hybrid worms hatched the 25th May, and fed on the leaves of the morus rubra, they were neglected during my 12 days absence, and hence did not do so well; yet they also began to ascend on the 16th June, and continued ascending until the 20th June. From the cocoons of the quateroons, moths began to issue the 19th June, and continued issuing up to the 24th of June. From the cocoons of the hybrid moths issued the 27th June and daily to the 2d July. All coupled and laid eggs at the usual period, but on this, 6th July, not a single egg has yet hatched. The quateroon cocoons, third crop, are larger and finer than those of the hybrid cocoons from which the female issued. The hybrid cocoons, two-crop, fed on the native mulberry, are smaller, but the silk is finer, and several of the cocoons are of a glossy white. So many facts for the present. Their value and bearing will be seen by-and-by. Respectfully yours &c.

H. PERRINE.

MR. PHINNEY'S PIGGERY, AND FEEDING MANAGEMENT.

From the New England Farmer.

To the Editor.—Dear Sir—In compliance with your request I cheerfully devote a few moments to giving you an account of my piggery. I will premise, by the way, that the writer of an article which appeared some months since in the Yankee Farmer, and which I regret should have found its way in to many other papers, has greatly exaggerated the profits of my establishment. I have often stated, and now repeat, that the manure from my hog pens will pay for all the food which I *purchase* for them; the residue of their feed, by far the greater part, being the produce of my own farm.

When the average price of corn is one dollar per bushel, and potatoes 33 cents, and pork will bring 12½ cents per pound, I have no hesitation in saying that there is a handsome profit in raising pork for the market, *provided* the hogs be of the best breed. With such breeds I have always found that four quarts of Indian or barley meal, with an equal quantity of apples, pumpkins, potatoes or other roots well cooked, will give two pounds of pork. At this rate it will be perceived that there is a profit on the pork at the above price, exclusive of the manure the hogs make, which is of great value to the farmer, but by no means equal to the whole nor even half the expense of feeding.

My breeds are principally of the Berkshire full bloods, and a cross of this breed with the Mackey breed. This cross I have found decidedly preferable to the full bloods of either. I have an imported sow of the "Essex half black," being a descendant of the Berkshire, and highly spoken of by English breeders. The Mackey pigs were imported into this country from England some 15 or 20 years ago by Capt. Mackey, of Boston, and till within a few years were decidedly the best stock in New England and perhaps in America. When first imported, Capt. Mackey, on his farm at Weston, not unfrequently brought them up to 600 lbs. at the age of 8 months. In all the essential points, such as maturing early, lightness of offal, greater weight in the more profitable parts, thinness of skin, &c., they greatly exceeded the Berkshire breed. But by breeding *in-and-in* as it is termed, they had greatly degenerated, had become weak and feeble in constitution, small in size, ill shaped, and in some instances deformed. With the exception of the human species, no animal degenerates so rapidly by this practice of breeding in-and-in as the hog. Judicious crossing is the only way by which a good breed of swine can be kept up and preserved. By proper attention to this principle, all good and valuable qualities of a breed may be preserved, and the bad rejected; without it, the best breeds will soon become worthless. With a view of restoring some of the good properties of the Mackey, I tried crossing them with various breeds, and with none have I succeeded so well as with the Berkshire. The produce of this cross possesses all the good and valuable points of the Mackey, united to the health, vigor and size, without any of the coarseness of the Berkshire. The best pigs, however, that I have ever raised, and I can say without hesitation, the best I have ever seen, were produced by putting a full-blood Berkshire boar to a sow which was a cross of Mackey with the "Moco," a New York breed, the progeny being half Berkshire, a quarter Mackey, and a quarter Moco.

My stock of fattening swine usually consists of about one hundred, besides about fifty stores [or stock swine.] My time for slaughtering is in February and March, when half my pigs are at the age of 15 and 16 months, being the fall and winter litters of the previous year, the other half being the pigs of the spring next previous to killing, and are at the age of 9 and 10 months. The former in years past have weight from 350 to 400 lbs., and in some instances as high as 500 lbs. The latter from 250 to 350 lbs.

An inquiry is often made as to the best time of killing, or what age it is most profitable to slaughter them. On a large farm where much green herbage is produced, and where the value of the manure is taken into the account, I consider the pigs killed at the age of 15 and 16 months as giving the greatest profit. When it is intended to kill them at this age, they may be kept on more ordinary and cheaper food for the first 10 or 12 months or till within 4 or 5 months of the time of killing. The manure they make, and the extra weight of pork, more than pay the expense incurred in keeping them the longer time; but the spring pigs which are to be killed the ensuing winter and spring, must be kept upon the best of food, from the time they are taken from the sow until they are slaughtered.

The older class of pigs for the first 10 or 12 months, are kept principally upon brewers' grains, with a small quantity of Indian or barley meal or rice, ruta baga, sugar beet, &c., and in the season of clover, peas, oats, corn-stalks, weeds, &c., they are cut green and thrown into the pens; the next four or five months before killing they have as much Indian meal, barley meal or rice, with an equal quantity of potatoes, apples or pumpkins as they will eat, the whole being well cooked and salted, and given to them about blood warm. During the season of fattening, an ear or two of hard corn is every day given to each pig. This small quantity they will digest well, and of course there is no waste. Shelled corn soaked in water, made as salt as the water of the ocean, for 48 hours, with a quart of wood ashes added to each bushel, and given to them occasionally in small quantities, greatly promotes their health and growth. Their health and appetite is also greatly promoted by throwing a handful of charcoal once or twice a week into each of their pens. Their principal food should, however, be cooked as thoroughly and as nicely as if intended for table use. From long practice and repeated experiments, I am convinced that two dollars worth of materials well cooked, will make as much pork as three dollars worth of the same materials given in a raw state.

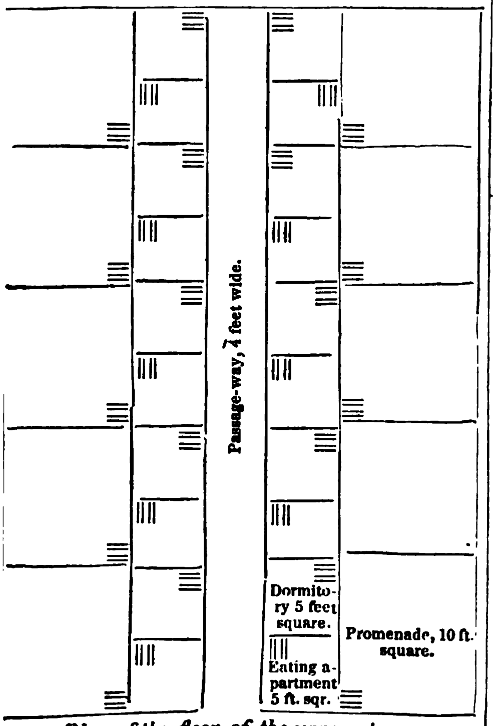
Pigs when first taken from the sow should be treated with great care, to prevent scouring and from becoming stinted; when either of these happens, it will require many days, and sometimes weeks, to put them again into a healthy, growing condition. When first deprived of their natural food, a little new or skim milk, boiled and slightly salted, and given to them often and in small quantities, will prevent scouring, and greatly promote their growth. If intended for killing at the age of 9 or 10 months, they should be full fed all the time, and kept growing as fast as possible. If on the other hand they are intended for killing at the age of 15 or 18 months, they should not be full fed, nor be made very fat for the first 10 or 12 months.

To satisfy myself of the benefit of this course, I took six of my best pigs, 8 weeks old, all of the same litter, and shut them in two pens, three in each. Three of these I fed very high, and kept them as fat all the time as they could be made. The other three were fed sparingly, upon coarse food, but kept in a healthy, growing condition, till within four or five months of the time of killing, when they were fed as high as the others. They were all slaughtered at the same time, being then 16 months old. At the age of 9 months the fat fed pigs were much the heaviest, but at the time of killing the pigs fed sparingly for the first 10 or 12 months weighed, upon an average, fifty pounds each more than the others. Besides this additional weight of pork, the three "*lean kind*" added much more than the others to my *manure heap*. These results would seem very obvious to any one who has noticed the habits of the animal. In consequence of short feeding, they were much more active and industrious in the manufacture of compost, and this activity at the same time caused the muscles to enlarge and the frame to spread, while the very fat pigs became inactive, and, like indolent bipeds, they neither worked for their own benefit nor for that of others.

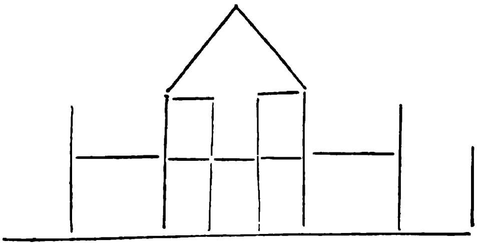
For the purposes of increasing my manure heap, my pens are kept constantly supplied with peat or swamp mud, about three hundred loads of which are annually thrown into my styes. This, with the manure from my horse stable, which is daily thrown in, and the weeds and coarse herbage which are gathered from the farm, give me about 500 cart loads of manure in a year.

On regular and systematic feeding and clean and dry bedding, the success of raising and fattening swine very much depends. A faithful feeder, also, who has some skill and taste, and withal a little pride of vocation, is indispensable. Homer informs us that much of the success of Ulysses in rearing his fine hogs, was to be attributed to his faithful Eumæus, whom the old soldier syled "god-like swine feeder."

The annexed is a rough plan, which may serve to give you an idea of the compact manner in which my hogs are kept. It is intended for a plan of the upper story and one end. The lower story corresponds with the upper, except that the promenade is extended out about six feet from the line of the upper outside promemade line.


Passage-way, 4 feet wide.
Dormitory 5 feet square.
Eating apartment 5 ft. sqr.
Promenade, 10 ft. square.

Plan of the floor of the upper story.



End View.

The roof covers the passage-way and eating and sleeping apartments on each side, and is made sufficiently high to enable the feeder to pass between the pens. The floors of the eating and sleeping apartments are made perfectly tight—the floor of the promenade in the upper story is laid with narrow plank, placed about one inch apart, so that whatever is dropped by the pigs, falls through on the compost beneath. The promenade of the lower story has no floor. The only passage for passing the pigs out and in, is by a slide door between each dormitory and the main passage-way. The pen being on ground which is a little higher at the end where the boilers are placed than at the other, the floor of the boiler room is on a level with the passage-way of the upper story, where the pigs kept in this part of the building are taken in and out. At the other end of the building, the floor of the passage-way in the lower story is on a level with the natural surface of the ground; and by a door at that end of the passage way, the hogs in the lower story are taken in and out. You will perceive that a pen 100 feet long and 34 wide, with 3 in a pen, will furnish ample accommodation for 120 hogs, A passage-way for the feeder is made from the cooking room to the passage-way in the lower story,

Very respectfully yours,

E. Phinney.

REMARKS ON THE "DISTEMPER" OF CATTLE.

To the Editor of the Farmers' Register.

I have often been surprised that our agricultural periodicals should contain so little on one branch of husbandry, which appears to me to claim more importance than many others which are so zealously discussed. I would attach no blame to the editors of such papers, because they are dependent upon others for contributions of that sort. Among the numerous communications to agricultural periodicals, we look in vain for the remedies by which to preserve the life of a valuable horse, or perhaps a still more valuable cow, or a faithful and favorite dog.

Since the improvement of our domestic animals, particularly "neat cattle," (which from their great value, are commanding very high prices,) it is of no trifling moment to the farmer that he should have his flock swept off without the means of relief. It is almost impossible to put too high a value upon a good cow. For my own part were I an idolater, there is no created being better deserving my homage than the cow, a worship infinitely more meritorious than that so often bestowed on some church or political demagogue.

For many years, cattle in middle and lower Virginia have been subject to a disease familiarly called "distemper," or more technically, what I understand to be the same disease, the "murrain." Being ignorant myself of the nature of this disease I will neither undertake to describe its symptoms, or suggest a remedy. The object of these remarks is to elicit from some of your subscribers, or any others who possess information on the subject, whatever they can contribute for the public good. Each one may be in possesion of some facts, which, when combined or compared, may throw some light on the subject, and lead to some remedy, in which all are more or less interested.

Various opinions have been entertained of the probable cause as well as the nature of this disease. But to my mind there has been no plausible solution of it; but, on the contrary, much which is unsatisfactory, and even contradictory. There are some who maintain that it is owing entirely to promiscuous and indiscriminate herding on the commons. This, however, is at variance with the experience of many whose cattle rove at large, and mix with other flocks with impunity; while others confined within enclosures without opportunities for infection, die. Such was the result of my own experience this summer, in the loss of two valuable Durhams, which had never consorted with an infected flock. As an evidence moreover of one of the *inexplicables* connected with this disorder, I believe instances can be produced of certain locations, and certain herds, which have been exempt, while those adjoining have suffered, under similar circumstances, as far as could be observed.

Dry, hot weather, with lean pastures, have with some been thought to have some connection with this mysterious disease; while others have found that rich pastures have been more favorable to it, and that fat cattle have been more frequently the victims. This year particularly has been remarkable for its moderate temperature and luxuriant pasturage, and as remarkable for mortality of cattle, in this vicinity.

All, I believe, who have had any experience on the subject, will agree that few escape the disease, and consequently death, which are brought from the west to the east, even for twenty miles; and yet I believe it is a fact that a large portion of those brought at an early age from the north, or from England, will escape. On this particular, however, I should like to hear what is the experience of others.

Many of the best farmers in the middle counties of Virginia rely with very great confidence upón the free use of tar, sulphur and salt, during the summer months, as a preventive. It is hoped that amongst the many intelligent farmers who read your journal that some will give what information they possess relative to the *prevention*, as well as cure of this singular and mischievous disease.

In a trip which I lately made to the county of Nottoway, I met with a farmer of some experience who gave me some curious facts relative to the disease under consideration, some of which he derived from Mr. Wm. M. Watkins of Charlotte, (who I hope will favor the public with the amount of his information touching that matter.) Amongst other things it was thought, that the disease called "hollow-horn" and the "distemper" were connected, and very many cases were cured by certain remedies applied to the horns. This is certainly contrary to all the opinions which I had formed on the subject; my observation had led me to the belief that the former of these diseases was only to be seen in the spring of the year, when the cattle had passed through a severe winter, or had been badly fed; whereas the latter is seldom to be met with except in the latter part of summer or autumn, when they are generally fat.

Since writing the above I have conversed with a gentleman of this place who has considerable skill, or at least considerable reputation in the cure of this disease. He also entertains the belief that "hollow-horn" and "distemper" are the same disease, or, as far as his observation goes, are invariably connected. He often preserves their lives by boring the horns alone, without any further remedy. The horns are invariably found to be hollow, in which he usually introduces vinegar and salt. Perhaps there is a deleterious gas to which the operation gives vent; and if so, would not the chloride of lime or soda, be preferable?

The remedy on which he relies with perhaps still greater confidence is very free bleeding, but, to be successful, it must be used at a very early stage of the disease.

If I am not mistaken, my young friend, E. G Booth, of Nottoway, has had some experience which would be of use to the public on this subject. W. I. DUPUY.

September 23rd, 1839.

We add to the above our request to the two gentlemen named, and to any others who may possess light on this subject, to furnish it for the benefit of the public. There are few things less understood than this strange disease of cattle in this region; and few evils of such frequent occurrence, and certain loss to the farmer, have received so little notice, or investigation to discover the cause, or the remedy.—ED.

REMARKS ON MAKING GOOD PORK AND BACON.

To the Editor of the Farmers' Register.

I do not know any thing of more importance than fine bacon, and it is seldom found even in Virginia. First, to make good bacon, the hogs ought not to be confined, or kept too fat, during their growth. If hogs are kept at a still house, or in small pens, their meat will not be as firm and sweet as those that have run at large, with a variety of food. The sows ought to be managed so as to feed the pigs but one winter. I prefer for family use hogs to weigh from 125 to 150 pounds, and, usually, not to let hogs of that size remain in salt but about four weeks; a few days longer if the weather is very cold; and a week *longer* if the hogs are much larger. A great deal of bacon is injured by too much salt, and too much smoke. It makes it dry and hard. I put a small tea spoonful of saltpetre to every joint, and have it well rubbed in with the salt (in pickling tubs.) When the meat has remained in salt the four or five weeks, it is taken out, and while wet, the joints are rubbed with dry hickory ashes, and then hung up, and smoked once a day until it is dry, and then in all damp weather. To make good bacon, the hogs must be healthy and fat.

The same remarks will apply as to mutton. Do not put too many sheep together, and let them have as great variety of food as possible, and plenty of salt. A VIRGINIA FARMER.

P. S. I consider it important to know to what age a mare (well taken care of) will breed. I have an old brood mare, the half sister of Gohanna's dam, that has a young colt by her side, at twenty-seven.

THE MULTICAULIS MARKET AND PRICES.

Since our last publication, there have been but few sales of multicaulis trees, and the market has continued as dull, as that of all public stocks. Still, notwithstanding the general depression, and, in some cases, also *panic*, there have been very few, and those but small lots, sold at any lower than previous prices—and the greatest sale, by far, went off at prices enormously and unprecedentedly high, for this season, considering the very small size, and necessarily small intrinsic value, of such trees. We speak of Mr. Physick's great sale. These small trees, at their average of 31¼ cents, were full as dear as trees of lower Virginia, of 6 feet average height, (or of any size, which would here be called a *good growth*,) would be at $1.50 the tree. Some other auction sales were made just before this, in different parts of New Jersey, and at lower *nominal* prices, per tree. But when compared, for size and quality, with our trees in this region, the former were sold for better prices, than any yet obtained here. Where there is such an enormous disproportion of size and value in the different growths, and stocks in market, of different regions, it is idle and ridiculous, as well as leading to conclusions altogether false, to compare the money prices, as if *a tree* were a fixed quantity in size and intrinsic value. The growth of summer-layers, of this part of the country, taken tree for tree, are larger and more valuable, than the lots of trees sold by Mr. Physick. For these reasons, difference of size and quality should never be forgotten, when comparing prices of trees, north and south. We copy the report of this very large and important sale from two Philadelphia papers.

"*Large sale of Morus Multicaulis.*—The annexed it is a correct statement of the number, prices, and proceeds of the Morus Multicaulis, the property of Mr. Physick, sold Sept. 18th, by C. J. Wolbert, Auctioneer, at the Highfield Cocoonery, Germantown, Pa. The trees were sold as they stood in the ground, those under 12 inches to be rejected. Owing to a thin soil and close planting, the sizes of the trees were generally small, and the branches few, the average height, according to estimates made on the ground, being about 2½ feet. The purchasers were generally from a distance, the largest portion being from Missouri, Illinois, and other western states. The prices, it will be seen, averaged 31 $\frac{33}{100}$ cts. per tree, equal to 12½ cts. per foot.

50	rows, averaging	1200, say	60,000	at 30 cts.	$18,000 00
20	do do	1000, say	20,000	27½ cts.	5,500 00
10	do do	1150, say	11,500	35 cts.	4,025 00
52	do do	1150, say	59,800	37½ cts.	22,425 00
55	do do	1150, say	63,250	32½ cts.	20,556 25
30	do do	1200, say	36,000	25 cts.	9,000 00
1	do do	1000, say	1,000	22½ cts.	225 00
10	do do	850, say	8,500	17½ cts.	1,487 50
Whole No. of trees,			260,050	at 31 33-100	$61,218 75"

Phila. U. Gaz.

The bidding was very spirited, and the whole were sold in about half an hour. The buyers gen-, erally, purchased in very large quanties—and the prices, considering the quality of the trees, are enormous. The trees which sold at 17½ cents were not more then 18 inches high.

The jam of passengers in the ears was almost unparallelled, the number being so great as to require two engines to draw the train. It is supposed from 2000 to 3000 persons were present. The general result is, that Mr. Physick's sale has not only sustained all former prices of trees, but has in reality done a great deal more. Our repeated assurances that there was a western demand for trees is now abundantly realized, as the great bulk of these trees are purchased in Kentucky, Illinois, Indiana, Missouri, Ohio, and other western and south-western states.—*Morris's Silk Farmer.*

Proprietors of trees in this state, so far as we know, hold firmly for good prices; though the *asking* prices of the most sanguine have certainly been very much lowered, compared to their earlier and most extravagant expectations. The only very recent sales heard of are the following: The product of $100 worth of roots (600 roots) in Chesterfield, sold at $1000. Auction sales in Brunswick, (small amount,) trees 28½ to 35 cents. In Murfreesborough, N. C. 1000 trees, (from spring planted single-bud cuttings,) at private sale at 40 cents. These last were about 4 feet high on an average.

In the mean time, frequent and large engagements and appropriations of trees are making for next year's plantings, which serve to take out of the market very large shares of the whole growing stock. These are either contracts to furnish large numbers of trees in 1840, or arrangements to commence rearing silk-worms, which will require large plantings. From all these operations, we venture to predict that not one-third of the growing crop will come into market at all.

September 30.

The high prices obtained at Mr. Physick's sale are likely to have an injurious effect on the market. These prices, added to the previous panic, and consequent anxiety of many persons to sell, have caused an immense number of trees to be advertised for sale, and at auction, and for cash, or very short payments. This most impolitic course, of *forcing* sales six or seven months before they can possibly be wanted for planting, (their only use, so early,) will at least test the vital powers of the commodity; and if prices are not for a time reduced to one half, or to less, by this glutting of a before dull market, then it may be relied on that there is an intrinsic value in the article, surpassing the speculative demand, and that nothing *can* destroy its market. And this forcing of sales is to be done at a time when United States Bank post notes are selling at 24 per cent. discount, and the best public securities and stocks at prices unprecedentedly low, compared to their acknowledged value as investments; and when stoppage of specie payments by the banks is openly recommended by a commercial paper in New York, to alleviate the intolerable existing pecuniary pressure. If, under such circumstances, the producers of wheat were to insist upon selling the next surplus crop of the country, six months before it could be put to any use, it would certainly put down the price to less than half the expected future rates.

The result which this most unpolite procedure may produce, of a temporary protraction of prices, would be as injurious to public as to private interests. The foundation of silk-culture is now laid so firmly and broadly, that nothing will prevent the structure being finally erected; and this would secure good prices for trees, not only for this year, but also the next, even if there were not a single individual speculator in the market. But a sudden depression, now, would cause the erroneous impression to be made on the public mind, that the advocates of silk-culture had lost confidence in its value and profits, and would thus serve at least to retard its general or extensive establishment. We believe that every tree raised in the country next year will be wanted to supply the actual demand for feeding silk-worms, or to make provision for the future feeding. And if so, the lowest price that can well be conceived, even 5 cents the tree, will give a very good profit to the planters of southern stock at 50 cents, or at the highest prices yet obtained, or asked, this season in Virginia. The general price of the young white mulberry trees in France, is a franc a piece, (about 19 cents,) though that kind has been cultivated there, for sale and for feeding, for some centuries. Why then, if wanted for use at all, should not the *morus multicaulis*, which is intrinsically worth so much more, and as early as 1840, sell for one-third at least, and more probably two-thirds, or more, of the regular price of *morus alba* in France? The occurrence of this result will not depend on the action of speculators, nor be prevented by a present depression of price, if caused by the means above mentioned; but will be founded on the actual operations of, and the certain and undoubted profits to be derived from silk-culture. With the success of this culture taken as a postulate, we may pronounce that every present holder of trees may safely withdraw from the market, keep his trees until next spring, (and standing in the fields, if in Virginia or more south,) if no purchasers offer sooner, and then, if not sold, convert the whole stocks to plantings; and he may count on greater profits from the crop than from pursuing the opposite course. On the other hand, it is not necessary to repeat, what we have often said already, that *without* the establishment of silk-culture, or its success being in certain prospect, the whole mulberry cultivation and trade would indeed be nothing but a bubble.

After the above was partly in type, we received the last Philadelphia Silk Farmer, by the mail of the 30th, containing the following editorial statement and remarks on the same subject.

"In relation to trees generally, we may inform our friends at a distance, that the high prices obtained for Mr. Physick's trees have induced many holders to advance theirs, and to make others firmer without advancing. On the other hand, many whose necessities are urgent, are forcing their stock into the market by auction and otherwise, for the purpose of obtaining money. We nevertheless know of various sales in the neighborhood of the city, at 50 cents per tree, and some farther off as high as 75. The pressure for money is severe beyond all former example; and seeing for ourselves how keen it is, the only wonder with us is that trees sell at all. Money in our market commands from two to three per cent. a month; yet the tree growers appear to think that buyers will borrow money at that extravagant rate to purchase their trees!

"Growers at the south should steadily keep in view one most important fact—their trees are far superior in quality to ours, and hence should command a proportionately better price. The prices obtained with us for the small sized and poorly branched trees of the north, ought not to regulate the prices of the large southern trees. Being better in quality they ought to yield a better price, and cannot fail to do so, unless prematurely forced into market.

"We know of several large sales of trees made in this city the present week, by private contract, at excellent prices, much higher than can be obtained at auction. The number sold is nearly 100,000. These sales would be more frequent, but form the disposition manifested by some persons to force off their trees. Our view of the whole subject remains unchanged, and we still believe there is a demand over the country which will take off all the trees at present in it. The scarcity of money may compel hundreds to defer their purchases until spring; but the demand at that time will only be the more active."

THE "CHINESE TREE CORN," OR THE "GRANT THORBURN HUMBUG," AGAIN.

Immediately after the earliest announcement of Mr. Thorburn's wonderful corn, which he sold, *for charitable uses*, at 25 cents the ear, we expressed our hearty contempt for the corn, and still more for the pretensions of its lucky *discoverer* and charitable salesman; and from time to time since, we have bestowed more of similar notice on the subject than its importance merited, in any other point of view than the boldness, and yet the remarkable success, of so gross and palpable an imposition on the credulity and gullibility of the agricultural public. Another reason for thus paying to Mr. Thorburn so much more respect than he would otherwise deserve, is, that by his superior performance in this line of business, he may be considered as the very head and front of the numerous class of humbug producers and salesmen, of the present day. Taking him therefore as the most excellent of the whole class, we use him as a hook on which to hang remarks applicable to the humbug business and its operators generally. We believe that we stood alone, among the conductors of agricultural and other journals, in *attempting* (for our effort was a complete *failure*,) to expose and put down this proposed new plan of levying contributions on the credulous, for charity's sake; andthe good-nature of most editors even assisted the planner, by republishing gratuitously his advertisement, and some, also, in offering their additional eulogies of the corn, the charitable scheme founded thereon, and the great public benefactor who had discovered the one, and planned the other. But since the numerous crops have been made from the ears sold at 25 cents, and even $1 each, editorial as well as other censures are appearing, which if less harsh than ours, will at least amount, in the language of our brother editor copied below, to Mr. Thorburn's getting for his reward, figuratively, "more kicks than coppers." But the "coppers" are in his pocket, tangible and available—and the "kicks" are but figurative, and administered at such a distance, that their force is wasted in "thin air," and are neither felt nor regarded by one who is so encased in brazen armor, as to devise, and conduct to a successful issue, the "Chinese tree corn," humbug.

We copy below editorial articles from three different agricultural journals, which have been lately received.

"*Chinese tree corn &c.*—We have seen several crops of this corn, and our opinion of it is far less favorable than that of our correspondent. It is in our judgment, not only absolutely but relatively, worthless. It bears no comparison in value to several other varieties cultivated here. We believed it a humbug from the first, and refused to plant a grain of it. Whether it is *bona fide* of *Chinese* origin or not, is of no importance. The quality of the product is all in which we feel any interest. Does the "Chinese tree corn" answer the description of Mr. Thorburn? All that we have seen falls far short of it. There are some suckers shooting up from the ground, some of which, as is the case with the suckers of all varieties of corn, produce some grains, almost a nubbin if you please, at the end of the shoot. But is this bearing a ear at the end of the *tree-like branches*? We have seen it side by side with other corn, and all we can say for it is, that it has no peculiarity but its worthlessness. How easy it is to humbug and be humbugged! What is to be the great humbug of next year? There must be one or more; and we have been looking out for their announcement. In a month or two we shall certainly hear from them. Mr. Thorburn, if he can derive no other gratification from his patriotic distribution of this rare corn, can at least enjoy that of counting the money he received for it—or, it may be, in referring his conscience to the receipt given him by the secretary of the charitable institution to which it was understood he was to give the proceeds as a gratuity. The receipt no doubt, is carried in the nearest proximity to his conscience--in his *pocket*.--*Franklin Farmer*, *Aug.* 31.

"*Tree corn.*—This corn has been planted to a considerable extent and by a great many persons in parts of the state which we have visited. We have seen fields of it containing a quarter of an acre, and some more. It does not appear adapted to our climate, and there is a general disappointment in respect to it. We must not judge the case until the hearing is through; but much of it will require two seasons to ripen it, and we advise the cultivators to take it up, as is recommended in the case of the morus multicaulis, and set it out again next spring. If it lives and does well, we think it likely, or as the Dorchester schoolmaster said, "we presume to venture to hazard a guess," that they may get a crop next autumn. We are sorry that our agricultural friends are so disturbed with it. It seems to have "roiled" (?) the most philosophical. For his Withington wheat and his tree corn, we hope our friend Thorburn will not get as many "kicks as coppers." He has got the coppers—we are afraid from indications which we have seen, that he would get from some of our friends the rest of the change, if he should come too near to them. Brother farmers, keep cool! We cannot believe, we will not believe, that our friend Thorburn designed to impose a bad article upon any one, certainly not with any knowledge of the fact. The seed of this tree corn seems to have multiplied in the country like the pieces of the original cross in Europe, of which there is no doubt, that many, many cords have been sold by the priests as genuine, and "no mistake."—*New England Farmer*, *Sept.* 4.

H. C."

* * * "As we anticipated, the China corn is a complete deception practised upon the credulous and confiding public.

The evil done in playing off this money-making game is of a serious nature in its effects, and deserves the severest reprehensions. The price of the corn, and even the expense of cultivation added, which is much more, is but a trifle of the loss sustained by the community. The public is deceived, and this will lead to suspicions when new productions are announced, which might lead to agricultural improvement.

We believe that there is no such thing as the China corn, as described by Mr. Thorburn, to be found in the country—no corn of so large a size that will be fit to boil in two months from planting, under the most favorable circumstances of climate, season, soil and culture. We challenge any man to produce from any part of the world such corn. Some corn obtained, as we are informed, directly from Mr. G. Thorburn, is far later than he stated, making all due allowance for climate, season, &c.

We have some of the *humbug* corn, (this is a more appropriate name,) and it is as late as the Virginian, and is doubtless the same; we have seen much of it, and have had many accounts of it from different parts of the country, and it evidently is the southern corn. We saw some three and a half months after it had been planted in a favorable situation, and it was but just spindled. Other corn by its side was a month earlier, and yet this last was not so early as Mr. T. said the China corn was.

Mr. Sanford Howard, who ably conducts the agricultural department of the Zanesville (Ohio) Gazette, says he planted a part of two parcels of corn, *both from Thorburn's seed store*, New York, and that one kind was ten days later than the other; that the earliest was as late as that usually cultivated in that state, and there was no appearance of its branching out like a tree as stated by Mr. T. Some farmers observe that it will require two years to mature this corn."—*Yankee Farmer.*

But Mr. Thorburn will doubtless be much astonished, (even more so than he was at his own success in this plan,) to learn that there is yet a bolder adventurer than himself, who has seized on his famous humbug, and offers to run it a second year, for his own private benefit, disregarding the aforesaid Thorburn's just claim of priority of discovery, and also the claims of charity upon all the *net profits*. A Mr. Sangston [qu. *sangsue?*] of Maryland, has, in the American Farmer, given a most flourishing account of his crop made from his planting of Thorburn's seed, and offers to sell 2000 ears of the same, at Thorburn's last year's price of 25 cents per ear ! ! ! But this is a *little* too strong; and Mr. Sangston's movement is more to be applauded for its unprecedented boldness, and full confidence in the immeasurable gullibility of mankind, than it will be for its success. When it is considered what a great quantity of this marvellous corn was sold last year by Mr. Thorburn (or what passed for such,) and that every grain, so dearly bought, and highly prized, must have been planted and cultivated carefully, and that the increase must have been at least 500 per cent. upon the original charity stock, it can scarcely be believed but that the high price and ready market of the corn must be already as completely at an end, as is its high reputation.

In our last number, we called on Mr. Thorburn for "his report of the charitable purposes to which his great harvest of profit was to have been appropriated, according to his promise," and of which the public has heard nothing in the way of performance. As no such exhibit has been made, or appears to be forthcoming, and as Mr. Thorburn has continued most ominously silent on this subject, since the planting and selling season ended, we now repeat our call for a statement of the account current of "Chinese Tree Corn to Charity Fund, Dr.," and the receipts for the payments made in acquittance of the balance due. Though a brother editor told us that this hint of ours was "really too cruel," we still must repeat it. But as such an exhibit will probably be a difficult matter even for Mr. Thorburn to present, and as the settlement we doubt not has been *already made*, and the *balance fully paid*, we will presume to offer a form, which may serve the purpose, though of course the items are altogether conjectural.

Grant Thorburn in account with Charity,
Dr.

To cash received for 20,000 ears of "Chinese Tree Corn," at 25 cents the ear,	$5000 00
Per Contra.	
By purchase made by him of 125 bushels of corn, the stock in trade, at 90 cents the bushel, - - - - - -	$112 50
Cash for writing and printing puffs, on Chinese corn, and his charitable motives, paid in ears at 25 cents each out of his own private *extra* stock - -	488
Discount allowed to wholesale purchasers at 25 per cent - - - -	1000
Reward of his ingenuity in inventing the plan of this charitable speculation	1000
Wear and tear of conscience and reputation incurred in conducting the same - - - - - -	2399 50
Credits	5000 00
Debit	5000
Balance,	0000

CORRESPONDENCE.

[Communicated for the Farmers' Register.]

To Gideon B. Smith, Esq.

Sir—Among the many thousands of your countrymen who acknowledge your early, long continued, disinterested, and efficient services in urging and promoting the culture of silk in the United States—especially by providing the best means, by pointing out the peculiar value of the morus *multicaulis*, and inducing the propagation and extensive cultivation of that new and valuable tree —a few persons have united to provide, by subscription, some testimonial of their gratitude, and sense of your merit in this respect.

The duty of receiving and disbursing the sum subscribed was confided to the undersigned; and they have the gratification of now presenting it to you. They request its acceptance, not for the value of its amount, but for its object. A part of the fund has been expended to provide a tea and coffee set of plate, richly chased, and ornamented with suitable devices and inscriptions, and which will serve as a visible and permanent testimonial of the feelings and opinions of the contributors.

EDMUND RUFFIN, }
THOS. S. PLEASANTS, } *Committee.*
JOHN H. COCKE. }

Virginia, September, 1839.

Answer.

Baltimore, September 25, 1839.

Gentlemen—I have received your very kind letter of September, 1839, with the accompanying testimonial of the feelings of the contributors, consisting of a most splendid coffee and tea set of silver plate. I am unable to express my feelings on this occasion—feelings, I assure you, of unmixed gratification, and which are incapable of representation in words. I thank you and the gentlemen associated with you in this testimonial, not only for the matter, invaluable as it is, but much more so for the manner of it. From the beginning to the present time, I have had but one single object in view—the good of my country, my whole country, and nothing but my country; and I feel doubly gratified that, however humble my works may have been, my motives have been duly appreciated. It is now something upwards of thirteen years since I have been devoted to the introduction of the silk-culture in the United States. I saw in 1826 that it could be made a profitable, and of course a valuable object of attention in the United States, even with the then known species of mulberry, *morus alba*. How much more certain I felt of its practicability in 1830 when I ascertained the valuable properties of the *morus multicaulis*, I leave you to judge. I pursued the subject with all my heart, and all my might, without ever once thinking whether I was to benefit myself in the smallest degree or not—from first to last I never once thought of self; and when I saw others making fortunes, it never occurred to me that I had omitted an opportunity of doing the same. Your most splendid *testimonial*, therefore, invaluable in itself, is still more precious to my feelings, from its coming to me unexpected and unsought for.

Be pleased to accept my most grateful thanks, and also to convey the same to your associates, with the assurance of a continuation of my exertions in the good cause, now rendered more than ever dear to me.

With high respect, gentlemen,
I am yours,
GIDEON B. SMITH.

To EDMUND RUFFIN, ESQ.
THOS. S. PLEASANTS, ESQ. } *Committee.*
GEN. JOHN H. COCKE.

Inscription on the plate.

To GIDEON B. SMITH,

In testimony of his early, disinterested, and efficient services, in promoting the culture of silk in the United States; and especially in making known the peculiar value of the *morus multicaulis*, as the most important means, and inducing its extensive cultivation and use.

Since the last publication of prior contributions to the "Smith fund" the committee have to acknowledge the receipt of the following:

From Israel Kinsman of Philadelphia	$200
Edmund Ruffin, Jr. Virginia	75

ON EXTRAVAGANT AND SOUND ESTIMATES OF PROFITS OF SILK CULTURE.

For the Farmers' Register.

The experiment of the Rev. Mr. McLean of New Jersey, does not warrant the conclusion, that $1000 per acre may be realized from the culture of silk.

In the Farmers' Register, and other publications, I have frequently declared that such estimates of profit from the culture of silk, as that referred to above, are mischievous, and worthy of ridicule and contempt. I do not charge the publishers of such statements with insincerity and intentional misrepresentation. Very sincere and good men are liable, in times of excitement, to deceive themselves, and under the influence of self-deception to promulgate *theories* with a confidence of assertion that *facts* above can justify. Our cautious and calculating farmers are not in the habit of riding in *balloons* and *parachutes*, but are quite familiar with the sober realities that are found near the surface of the earth; and so far from crediting these extravagant estimates, they look upon them as truly ridiculous and contemptible; and unfortunately many of them include the culture of silk itself with these wild estimates, imbibe strong possessions against it, and regard it as a *humbug*, created for the purpose of speculation. If men who have no *facts* on which to base their calculations, must publish their theories, they should strive to keep within the bounds of probability.

The experiment of the Rev. Mr. McLean was *accurate*, and no doubt *faithfully* reported, and proves that 500 pounds of cocoons, or 50 pounds of reeled silk, may be produced from an acre, the same season that the morus multicaulis trees are planted. There is nothing wild or extravagant about this estimate; but to infer from it, that when the trees are four or five years old the product will be 200 to 300 pounds of reeled silk, in my view, manifestly shows the want of judgment.

Mr. McLean had on his ground, at the rate of 37,120 trees to the acre; and while I admit that trees planted thus closely might thrive for a single year, I know that the second or third year, they would become diseased, and the fourth or fifth year they would be likely to fare as Cobbett's cucumber vines, viz: "die of *natural starvation*." When the roots of the morus multicaulis begin to interlock, and contend with each other, the leaves become full of yellow veins and spots, and do not attain more than one-fourth their usual size, and are, of course, unsuitable food for silk-worms. I, therefore, think it apparent that Mr. McLean's experiment affords no foundation for *high pressure* calculations. Those who must have such enormous profits, had better go to work as Mr. McLean did, and report the amount of product in cocoons, or reeled silk. LAYTON Y. ATKINS.

Stafford co., Va., Sept. 1839.

EXTRACTS FROM PRIVATE CORRESPONDENCE.

Gloucester, Sept. 15, 1839.

I have pursued the improvement of my farm with more spirit this summer than I have been able to do heretofore. Having succeeded in getting out my crop of wheat earlier than usual, I have been enabled to devote my whole force for near five weeks to carting out marl and marsh mud, before I was obliged to stop to pull fodder.

I have been able to go over such a surface, as surprises me when I look at it, having gone over fifty acres, and the manuring faithfully done. I had four tumbrils, and sixteen or seventeen hands at work.

The latter corn in Gloucester is surprisingly fine; the forward corn on the best lands being about an average crop. I have lately returned from the upper country, where I found the corn, every where I visited, as good as the land was capable of producing. The wheat crop in Orange and Culpeper is very bad; I heard of returns there the smallness of which would surprise even a lower Virginia farmer. Here the wheat crop has been a fair one; and as long as we can make from 10 to 15 bushels, after corn, by the aid of marl, we need not envy the upper country the boasted influence of plaster, which is inefficient here.

Beaufort, North Carolina, Sept. 8, 1839.

Your works have been a great source of information to me on the subject of farming; for by their instructions I have been enabled to raise on land that would not produce, 3 years ago, ten bushels of wheat to the acre, I have this year raised 25 bushels to the bushel sowed, done by liming my land and sowing down in peas. I have tried this year a few of the skinless oats, and I must say, they surpassed any oats that I have ever tried.

MONTHLY COMMERCIAL REPORT.

For the Farmers' Register.

No favorable change has occurred in commercial affairs during the present month. The scarcity of money has even increased, and is most severely felt in the northern cities, where the rate of interest is 1½ to 1¾ per cent. per month, on the best securities. The banks grant scarcely any discounts, and stocks of all descriptions are more depressed than they have been for many years. All descriptions of produce have fallen in price, and the spirit of commercial enterprise appears to be almost entirely dormant. This scarcity of money prevails also in Europe, where the rate of interest has nearly doubled. American stocks no longer find purchasers there, and those agents who went from this country to effect negotiations, meet with little or no success.

No mode of remittance from the south to the north now exists, unless it be by shipments of specie, which must return in the regular course of trade, attended with the expenses of transportation to and fro. In short, a greater derangement of money matters has scarcely ever existed. Public works are suspended for want of funds, and private enterprise almost paralyzed.

The result of the wheat harvest in England, although not ascertained with certainty, (on the 1st September,) was considered more favorable than by previous advices; and the consequence has been a decline in this country. The price of wheat in Baltimore is 100 to 105 cents; but owing to the very limited supplies in some of the Virginia markets, it still commands 105 to 115.

The crop of tobacco (of 1838) is now all at market. The inspections in Virginia show 28000 hhds. and the receipts at New Orleans a like quantity. In Maryland they are reported to be but 11000; but we have no accurate data.

The export to Europe since Oct. 1st, 1838, from
Virginia, is 19200 hhds.
From N. Orleans 15800
From N. York 5500

Those from Baltimore and other ports not ascertained. Prices in Virginia have not varied much during the month, and may be quoted $4 to $12, embracing all sorts of old. A little of the new crop begins to appear, but generally loose, in bulk, and is bought up by the manufacturers at about $6 for leaf. The crop will be large, and of good quality. That of Kentucky is reported to be much diminished by drought.

Of the old crop of cotton only 50,000 bales remain in all the ports; the closing sales are from 9½ to 12½. Supplies of the new crop began to arrive at New Orleans early in this month, but they will be retarded there as well as at Mobile, Augusta and Charleston, by the prevalence of yellow fever, which unfortunately rages with great violence this autumn. Although the crop of last year proves to be only 1,350,000 bales against 1,800,000 in the preceding year, the stock on hand in Great Britain is larger, and the price declining; so greatly has the consumption diminished this year. The first new cotton received at Petersburg and sold at 13¼ cents, is of fine quality, and such is supposed to be the character of the crop in North Carolina and Virginia. The season thus far has been favorable for maturing and gathering; but small progress in these has yet been made.

The crop of corn is abundant, and altogether the season in Virginia has been a most luxuriant one. Price of corn 62½ to 65 cents per bushel; bacon 10 to 12½ cents; apple brandy 45 cents. X.

September 28, 1839.

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CONDITIONS

OF

The Farmers' Register,

For Vol. VII. Prices still more reduced, for punctual or advanced payments.

I. The Farmers' Register is published in monthly numbers, of 64 large octavo pages each, and neatly covered, at $5 a year, payable in advance. Or, for $5 may be had *two copies* of the same current or forthcoming volume, for *new subscribers*, if so ordered and paid for in advance, (or at the time of making the subscription,) in current money, (as described below,) and without loss or deduction for postage, or any other charge to the publisher.

II. Subscribers now on the list, who have already paid the regular subscription price of $5 in the manner above required, for a single copy, shall have the privilege, upon sending a *post paid* order, of having a second copy of the same volume sent to any NEW subscriber, without further charge, for that volume.

III. A like privilege will be allowed to every old subscriber who has not yet paid, but who shall do so, as above, before the issue of the 12th number of the 7th volume; thus in effect REDUCING TO HALF PRICE THE COST OF THE WORK TO EVERY SUBSCRIBER, OLD OR NEW, WHO MAY CHOOSE TO AVAIL OF THE OFFER.

IV. If, however, no more than one copy is ordered, the subscription price will still be, as heretofore, $5 the volume; as it is not designed to permit any subscription, [illegible] payment, to be made for less than $5. And if an order is sent for two copies, without compliance with the conditions annexed, only one will be sent.

V. The price of back volumes, as heretofore, is $5 for one alone, $10 for any three together, and in the same proportion ($3.34 *cents* for each,) for any number of volumes; except that vol. I., is to be furnished only as part of a full set.

VI. ALL MAIL PAYMENTS MUST BE MADE IN NOTES, OR CHECKS, OF PAR VALUE IN VIRGINIA, or of a CITY and SPECIE-PAYING bank of the state in which the subscriber resides.

VII. The risk of loss of payments for subscriptions, sent free of postage, which have been properly committed to the mail, or to the hands of a postmaster, is assumed by the editor.

VIII. All letters to the editor in regard to the Farmers' Register must be post-paid—except such as contain articles for publication.

IX. If a subscription is not directed to be discontinued before the first number of the next volume has been published, it will be taken as a continuance for another year. Subscriptions must commence with the beginning of some one volume, and will not be taken for less than a year's publication.

X. The mutual obligations of the publisher and subscriber, for the year, are fully incurred as soon as the first number of the volume is issued; and after that time, no discontinuance of a subscription will be permitted. Nor will a subscription be discontinued for any earlier notice, while any thing thereon remains due, unless at the option of the editor, (or in obedience to the regulations of the Editorial Convention, copied below.)

XI. For all copies not received by mail, at the proper post offices, duplicates will be furnished to those subscribers *who have complied with their own obligations*; provided that the failure *shall be notified through the postmaster*, and *within two months after the date of the miscarried copy.*

Petersburg, Va., Jan. 1st, 1839.

General Regulations adopted by the Editorial Convention.

The following resolutions of the Editorial Convention of Virginia, will hereafter form part of the Conditions of the Farmers' Register, and will be strictly observed.

1. "All subscriptions shall hereafter be considered as incurred and due in advance, and for a year's publication, unless specially ordered for a shorter time, and paid for in advance for that shorter time, when so ordered.

2. "No publication shall be sent to the order of any new and unknown subscriber, unless paid for in advance, or satisfactory reference be made to some known and accessible person in regard to the subscriber or his payment. But, in case of an order for a publication, without payment, from a new subscriber who is unacquainted with the conditions, a single number may be sent, containing, or accompanied by, a copy of this regulation.

3. "The names of all subscribers, whose ability to pay may be unknown to the publisher, and who may remain indebted on open account at the end of two years, from the time when the advanced payment was due, shall be erased from the list of subscribers."

[*Resolutions of the Editorial Convention of Va.*

CLAIRMOUNT NURSERY,

Near Baltimore.

The subscriber has for sale on pleasing terms a large stock of the **MORUS MULTICAULIS MULBERRY TREES AND CUTTINGS**, which are warranted to be genuine, being raised by him from a stock he has been raising from for seven years. Purchasers may rely on getting a good article, and carefully packed, so as to go safely to any part of the union. The above would be sold much lower deliverable during the autumn.

Also a general assortment of all the most rare and choice grafted fruit trees, especially 20,000 **PEACH TREES** and shrub fruits. Ornamental trees and shrubs, Evergreen trees, grape vines and cuttings, succulent roots, &c. See printed and priced Catalogues, which will be sent gratis, by mail.

☞ Orders will be carefully executed by being forwarded to me by mail, or left with **DUPUY, ROSSER & JONES**, Druggists, Petersburg, Va. and **WILSON & SON**, Norfolk, Va. who act as Agents, and will receive orders at Nursery prices and furnish Catalogues as above.

ROBERT SINCLAIR, SEN.

August 28th.—4n&4a.

OSAGE ORANGE TREES.

I have two hundred plants of the Maclura or Osage Orange, from three to five feet high, which I will sell, deliverable next winter, at one dollar per pair, (male and female.) In a few years they will bear fruit abundantly. Orders may be left with the Editor of the Farmers' Register, or forwarded direct to

THOMAS S. PLEASANTS.

P. M. Beaverdam, Va.

James P. Peebles
J. P. Peebles

MULTICAULIS, ALPINE, AND OTHER MULBERRIES.

Wm. Prince and Sons, proprietors of the Linnæan Nurseries, near New York, are ready to receive orders to any extent for all the varieties of Mulberries, including the Chinese Multicaulis, American Multicaulis raised from Seeds, and very hardy, Expansa, Elata, Alpine, Canton, Broussa, Rose of Lombardy, Dandolo, Pyramidalis, &c., the six first named of which, surpass all others and are placed in rotation according to merit. The prices will be moderate, and terms easy, and priced catalogues will be sent to every one desirous of purchasing. Fruit and Ornamental Trees, and Shrubs, Green House Plants, Bulbous Flower Roots, Field and Garden Seeds.

Rohan Potatoes, &c. can be supplied, and priced catalogues will be sent to every applicant.

Aug. 31—r4t.

FORWARDING
By the Richmond & Petersburg
RAIL-ROAD.

Goods sent by this Railroad will, if so directed be forwarded to any point on the line of the Petersburg and Roanoke, or Raleigh and Gaston Railroads, and goods sent by those roads to Richmond, will be received from the depot in Petersburg and brought on. The depot agent at Pocahontas, will attend to the forwarding, but this company will not be liable for accidents or losses, except as at present on its own road. The freight and passage through, on goods sent from Richmond must be paid there in advance, and on goods sent to Richmond may be paid either here or in Petersburg. A forwarding commission of 10 per cent. on the freight of this road must be paid to the agent, which will be received with the freight and drayage.

Goods will, in like manner, be forwarded to, or received from any point on the line of the Richmond, Fredericksburg and Potomac or Louisa railroads, under the care of the freight agent at Richmond.

Richmond, Feb 1.—r. tf.

TO PLANTERS,
On and near the Appomattox,

FORWARDING BY THE
Richmond and Petersburg
RAIL-ROAD.

Produce sent down the Appomattox, will, if so directed, be forwarded by this Rail-Road to Richmond. The Depot Agent at Pocahontas, (Mr. Squires,) will attend to the forwarding from the Basin in Petersburg, and pay the drayage. The Company will not be liable for accidents or losses, except as at present, on its own road. A forwarding commission of 10 per cent. on the freight of this road will be charged by the Agent, and received with the freight and drayage.

Produce sent to be forwarded, should be accompanied by a letter from the owner to the Agent, to be delivered by the boatman at the Depot in Pocahontas immediately on his arrival.

☞ Freight on tobacco $1 per hogshead, on wheat 6 cents a bushel.

Richmond, June 30, 1839.—r&Atf

THE MOST PRUDENT
AND
Advisable Course.

In as much as there are many very indifferent Piano-Fortes bought and sold by individuals for the want of proper information on such subjects (and that information is absolutely necessary), there is not the slightest doubt, there being so great a difference in the manufacture of Piano-Fortes, well known to sensible and candid individuals, it would not be the most prudent and advisable course for persons in want of such articles to send their orders to a seller, who keeps such Pianos as have stood the test in upwards of one hundred and twenty instances, where they have been bought and used by individuals well known for their [illegible] particularity, a large number of whom have [illegible] universal their favorable opinions; particularly [illegible] where the Pianos are sold upon the condition, that if they are not what they are represented to be, they will be taken back or exchanged. The purchaser here has every advantage to gain, and nothing to *lose.* When orders are received [illegible] Pianos, and the selection is left to [illegible] I invariably get the assistance of our Music Teacher before deciding as to which instrument I [illegible] $300, $350 and $37[illegible] will purchase [illegible]

E. P. NASH, *Petersburg.*

June 30—tf James G. Carter

JUST PUBLISHED

And for sale at the Office of the Farmers' Register, Petersburg, the second American from the fifth English edition of John T. Jam[illegible]

DAVY'S AGRICULTURAL CHEMISTRY.

The text of this last English edition is precisely that of the edition of 1827, which received the last improvements and alterations made by the illustrious author; and the notes added in this last, are from the pen of its editor, Dr. John Davy, the author's brother.

No American edition of this valuable work has been published from any later than the first English; and even of those early and imperfect editions, but a few copies can now be found for sale. The work, in booksellers' phrase, has long been "out of print," and there are very few works that so well deserve to be reprinted, or are more essential in the library of every intelligent agriculturist.

In addition to the peculiar value possessed by this edition, as the latest and most perfect, it will be by far the cheapest yet published. By adopting the cheap form of the "Farmer's Register," "Essay on Calcareous Manures," and "Johnstone's Treatise on Draining, &c." the forthcoming edition of the "Elements of Agricultural Chemistry" can be furnished at one-fourth the cost of the earlier edition heretofore published in this country—and still lower compared to the last English edition, of which this will be a full reprint.

This work well deserves, for its subject and intrinsic value, to be adopted as a text book in all schools of scientific and high grades of useful instruction; and for *low price*, this edition, and other agricultural publications from the same establishment, might be economically and profitably adopted, as reading books in primary or common schools.

Price 75 cents the single copy, or $5 for a dozen. The work will be sent by mail, or otherwise, to order, for cash payments and post-paid orders.

$33000 Six per cent. Stock of the state of Virginia for sale, in sums to suit purchasers, by

ABRAHAM WARWICK & Co.

Richmond, August 27.

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Abraham Warwick
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THE

FARMERS' REGISTER,

A MONTHLY PUBLICATION,

Devoted to the Improvement of the Practice

AND

SUPPORT OF THE INTERESTS OF AGRICULTURE.

EDMUND RUFFIN, EDITOR AND PROPRIETOR.

Vol. VII. OCTOBER 31, 1839. No. 10.

And he gave it for his opinion, "that whoever could make two ears of corn, or two blades of grass, to grow upon a spot of ground where only one grew before, would deserve better of mankind, and do more essential service to his country, than the whole race of politicians put together."

Swift.

PETERSBURG, VA.

PUBLISHED BY THE PROPRIETOR.

1839.

[This publication consists of four sheets—postage for 100 miles or less, 6 cents—over 100 miles 10 cents.]

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PAYMENTS FOR VOL. III.

James Calwell	Greenbrier, Va.

PAYMENTS FOR VOL. IV.

Thomas Butler King	Wayne, Ga.
James Calwell	Greenbrier, Va.

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PRICES CURRENT—OCTOBER 29, 1839.

Country Produce.

Wheat	$1 30
Flour (superfine)	$6 to $7
Corn, per bushel 65 cents,	
Cotton, - - - -	9 to 11 cts.
Tobacco, new, - - -	$3 00 to $5
Butter, (hog round) - - -	11 cts.

BRANCH, WINFREE & CO.

SILK

TO FARMERS.

I can prove by actual results that [illegible] produce 20 bushels of cocoons in a crop of about 30 days time, and five crops can be raised in Virginia, North and South Carolina, and more south in a season. Not however, without a good supply of trees and proper fixtures. A bushel of good cocoons are worth $5, second and third crop $[illegible]. [illegible] selling your farms, they will go in [illegible] quick, if stocked with mulberries, which [illegible] might not without. The [illegible] very worse; do not wait until all the trees are taken by a few, and have to pay two prices, [illegible] for them, but come, or send early, and get the Morus Multicaulis Buds or Trees, and Silk Worm Eggs of all kinds, always at market prices, (be that what it may,) with instructions for keeping them in good order, founded on experience.

Apply at the office of the Virginia Silk Agency, Richmond, to J. H. D. [illegible]

N. B.—No person need expect their letters answered unless post paid.

Oct. 1, 1839.—[illegible]

Morus Multicaulis Trees,

AND

SILK-WORM EGGS

40,000 Morus Multicaulis Trees, now growing, very flourishing and remarkable for their many branches—they are raised from [illegible] fourteen [illegible]—each of them will [illegible] more than two [illegible]. I will sell by the tree, foot, or bud.

100 Ounces Silk Worm Eggs, principally of the mammoth large grey Worms—cocoons yellow, and considered a very superior kind—a few of [illegible] white and sulphur.

Persons designing to enter into the Silk Culture may find it to their interest to make early application to me, as there is now no question as to the superiority of Southern Trees and Eggs over all others. Terms accommodating.

E. F. HARRIS.

Petersburg, Oct. 1—[illegible]

☞ By the only typographical error in [illegible] "just" instead of "[illegible]," great injustice was done to the size of Mr. Harrison's beef, [illegible] of his advertisement. The proper correction is made [illegible]. PRINTER.

Communications on [illegible], and others, will appear next number. Essay on Vegetable Physiology (concluded);—Marling in Sussex, &c.—Diseases in cattle,—Oats as food for hogs.

THE FARMERS' REGISTER.

Vol. VII. OCTOBER 31, 1839. No. 10.

EDMUND RUFFIN, EDITOR AND PROPRIETOR.

ON KEEPING SWEET POTATOES. SQUASHES AS FOOD FOR HOGS.

To the Editor of the Farmers' Register.

South Carolina, August 25th, 1839.

I have thought, for some time past, of giving you an answer to some inquiries on the subject of preserving sweet potatoes, in your last November number, my mode of keeping them, and the only practice I have found uniformly successful. I have tried many of the plans that have been recommended for some years past. That recommended by your Georgia correspondent, P. C. H. I have been more successful in than any other; but have been frequently subjected to disappointments and losses, which resolved me, almost, to leave off raising any more than my family could use by digging time. And, I will here remark that, in my opinion, the practice of leaving a hole in the top of the bulk has been the cause of the distruction and loss of more potatoes, than all other practices together.

Having, in the fall of 1832, commenced putting up my crop as usual, one of neighbors who happened to be at my house, and to whom I was complaining of my bad success in keeping potatoes, requested me to let him superintend the putting up my crop; stating at the same time, on my expressing some doubts as to his practice, that if my potatoes rotted, he would furnish me seed gratis the next spring. I agreed to his proposal, and attended him to my garden to witness his *modus operandi*.

He first levelled a bed of suitable size, for the quantity of potatoes intended for the bulk; but did not raise it, as recommended by P. C. H., as taking the earth to the depth of eight or ten inches from around the bulk, to coverit with, would leave the potatoes sufficiently elevated. After levelling, he laid on some dry straw, (not much,) and on that the potatoes. When the heap was finished, of the usual form, straw was laid over, of sufficient thickness to keep the dirt from mixing with the potatoes; then earthed entirely over, and made compact, to the depth of a foot; the soil being of a loose and open nature. The object being to *exclude the air entirely; the "sine qua non."*

"It is important" said my friend, "to have a good shelter over the bulk, for, wherever water penetrates to the potatoes, there you will find, on opening the bulk, some rotten ones; but otherwise all will be found perfectly sound. There should, also, be a drain leading from the excavation around the bulk, (which should be smoothed out at bottom,) to draw off the water that might, by standing too long, be taken up, and injure the potatoes."

Thus, I have given you sir, in my loose way, my friend's mode, which I have practised for six years, with entire success. I put up both my eating and seed potatoes in this way; my bulks standing at the base about four feet apart, and on a line, so that my shelter may be continued the whole length of the line of bulks; breaking when wanted for use, one at a time, and removing it to my potato house. Which, if I thought it was necessary, I would willingly give a description of; but, as almost every farmer knows how the cellars in common use are made, I think it unnecessary; except to say, (and that is very important,) that the upper part of mine is left open throughout its whole length, and over which, to keep out rain, a short set of rafters are straddled, lathed, and a course of three feet boards nailed on each side. I am of the opinion, that it would be an advantage to extend the roof down to the edge of the ditch that surrounds the house, in which case the covering of earth would not be necessary to be so thick as is common.

My puncheons were split in the spring previous to building my house, and laid up to dry; and for several days previous to putting in my first potatoes, which consisted of all those that were cut or broken in digging and removing to the bulks, I had a small fire kept up in the house; and my practice has been to keep up a little smoke in it for a few days after removing each bulk to it, and also, during every cold spell through the winter. Keeping only the slat shelter closed in mild weather, and in cold weather, closing both; but, at no time do I close up the opening at the top of the house, which is intended for the escape of moisture and smoke. Thus, differiing with almost every one else, in *closing* my bulks which are commonly left open, and in *leaving the top of my cellar open*, which is usually closed by others. I would here remark, that the *opening* spoken of, is nothing more than the cracks at the ends of the puncheons, at least three inches of which should be left naked.

I have found my cellar very convenient for keeping roots of every description in, for winter and spring use; such as beets, carrots, parsnips, &c., and one winter I kept a crop of cauliflowers in it, (the heads of which continued to grow for some time after removing them from my garden; the roots having been laid together, and lightly covered with moist earth in packing them away).

Potatoes should, *invariably*, be dug before a heavy frost; for, I have found that whenever the vines were thoroughly killed, those potatoes nearest the top of the hill were injured. They should also, be carefully handled, as they are frequently bruised, and much injured, by throwing them to the piles, and into baskets; and, also, in emptying them into the baskets. Most persons recommend them to be well dried, before putting them up; I would prefer airing them, myself, weather permitting; but have put them up on the same day they were dug, and found them as sound on opening my bulks, as those that had been dried.

In looking over some volumes of the American Farmer, a valuable work which I commenced taking in 1829, and which very much alarmed some of my friends, least I should be ruined by "book-farming," I find some information on the subject of the preservation of sweet potatoes, that you may think worth transferring to the Farmers' Register, for the benefit of your readers, particularly in the 12th vol. p. 139 and in the 14th vol pp. 75, 193 and 258.

I have always been afraid to venture on keeping a large quantity of potatoes in a cellar, as seems to have been the practice of the writers of the communications above referred to; but do believe the *smoke* (as recommended by them) to be absolutely necessary in preserving, even a small quantity, any length of time; and the authority is very good, that it will have the desired effect with any quantity.

I will only add in conclusion of the subject, friend Ruffin, (and I consider you the best friend of every farmer,) that if any one of your readers should not have faith in the plan I have above attempted to recommend, let him try it on a small scale. And I am certain his faith will be strengthened "by works."

As I have some room left, I will communicate a fact to my brother farmers, the knowledge of which (if acted on,) will, in my opinion, prove highly advantageous to them, particularly those in the southern states that have no clover pasture for their hogs to run on, at a season of the year when food for them is generally scarce; and where stubble land should be at rest, instead of having every thing eaten off of it, and trod to death in the bargain. But, to the fact; it is, *that I am at this time feeding to my hogs* (a small stock,) *two bushels of squashes daily*. This from a half acre of poor land, manured in the hill with the scrapings about my pens, principally corn-cobs. Having last spring, resolved on the experiment, I laid off an acre of land for the purpose; but, could not procure seed to plant so much. The half, therefore, that was intended for the latter planting, I had planted in pumpkins; and although the season had been unfavorable to both, the yield has been astonishing; and has convinced me, that vines will amply pay a man for the additional trouble of cultivating them to themselves; not taking into account the injury corn sustains by crowding them on the same ground with it.

In gathering my squashes (of which I have a great variety) I have my patch gone regularly over, so as to use them before they become too hard; but if some should become so, they are not lost; for my hogs appear to be equally as fond of them as the soft ones.

As soon as they are penned, I intend to commence feeding my fattening hogs on the pumpkins; first boiling and mixing a small proportion of corn and cob-meal with them; and to continue that food as long as they last. Then with dough made from the meal, and to finish on.

I have never known any person besides myself, to raise the squash with the view only of feeding hogs, though it has in all probability been done. I am very sanguine in the belief however, that if the value of the article as food for hogs, was *generally* known, the practice of raising them for that purpose would be, in the south, universally pursued.

To conclude, if by writing this communication, I can succeed in introducing such practices as are recommended, I shall be happy in believing that I have not lived altogether for myself. S......

BREEDING AND REARING SWINE.

From the Franklin Farmer.

For economy, I would advise the farming community to select out of their herd of swine, every spring, as many female pigs as they may think will produce them as many pigs as they may be prepared to rear through the winter for family or market use, and to have this lot of young sows kept in a lot sufficiently close to prevent males from getting to them. Should the grazing on the blue grass or clover not be sufficient to keep them in a good healthy growing condition, I would advise a small proportion of corn, given regularly morn and noon, to assist their regular growth. And as I have, from my own experience with a lot of eleven head, having only ordinary blue grass woodland pasture, made a regular practice morn and noon, of giving them 8 or 10 ears of corn at a feed, I can say with safety, by so doing you will be well paid for your husbandry. Your sows will have health, good sleek coats of hair and good stamina, and they will not be hurried in their growth, then the animals will be much more capable of propagating. Young sows kept in this way will weigh from 120 to 160 lbs. when about 8 months old.

Sows are susceptible of conceiving when 4 or 5 months old; but for better size and form, I would recommend not to breed them until they are about 8 months old, that their first littering will be when they are about 12 months of age. Sows impregnated from the 20th to the last of December will bring pigs from the 10th to the 30th April, as the period of gestation is about 112 days. I have a number on record of the above age, and find their produce to be from 8 to 13 pigs a litter. I know the usual wants of the farmers, by hearing them frequently observe, by their fire side, "let me have my stock of pigs to come the first of March," and at the same time, unconsious of the danger of severe storms and bold blasts in March—and the little economy they have in providing shelters for their sows—frequently lose there entire stock of pigs, which is of no small value to a farmer that has his plan laid out to rear a great number of hogs, consequently must buy a stock; or sell their grain at reduced price. I have experienced the loss more than once, to a considerable amount, consequently I have postponed breeding as before mentioned. Thus I have the security of better weather and the benefit of vegetation, which has a good tendency to correct any indisposition in sows, which frequently occurs in animals as well as human beings. They are subject to inflammatory colds, and fever succeeding, dries up their milk, the pigs perish and death intervenes. To insure the farmer a quick and rapid growth in his lot of pigs, let them come about the last of April, (say 20th) which is far preferable to March pigs. which have sustained much injury while very young. Stunted by frost and hunger, they cannot be well resuscitated by the best of attention afterwards.

In an ordinary way, sows suckle their young in the spring from six to eight weeks, but in the fall the sows frequently wean their young in about six weeks. I would say to make your pigs thrive and grow on without much injury in their looks from weaning time, the better way is to prepare a covered pen for your pigs, and have a hole sufficiently large so they can go in and out at pleasure, and always keep shelled corn by them. Be particular to commence thus feeding when they are about three weeks old, and it will aid the sow in rearing them, consequently they will wean them kindly and grow on without any ill effects which are common to weaning. These pigs will have age and sufficient growth by good clover and blue grass—will winter kindly, which will insure the farmer a regular growth in his lot of hogs by the common mode of corn feeding, or following corn-fed cattle, the excrements they collect from them is equal to cooked or steamed malt. After weaning their litter of pigs, I would advise all the old sows to be spayed, while reduced in flesh by suckling, as the period is most favorable. A careful hand performing the operation in the left side, I seldom or ever lose any of that age and healthy rearing. They will fatten kindly, and make about as much weight at selling time as their brothers of the same litter. You now perceive I do not winter any hogs more than one winter. I can say from experience, that sows with pig, winter better than barrows. They should be kept in a large woodland pasture if practicable by themselves, to prevent any injury from other hogs. Be careful to have a house or shelter to protect them in imclement weather. Continue to select every spring the best female pigs out of your litters, as many as you may think will produce as many pigs as you may want to breed from, and by so doing you may rear your hogs on your farm at a moderate calculation of 20 per cent over above the prevailing practice of the day. As in the common way the farmer has his males and female running together at large, then they may expect to have litters of pigs every month in the year; the uneveness of the lot of hogs and consequently the stronger will be certain to abuse the weak (a hog is a hog by name and nature) and having masterly strength and in all cases the weaker are driven from their food and comfortable shelter in the forest; and in many cases we have a proof of the uneconomizing rural system of our farmers by having all sizes and ages. In our usual winters we see the small class of hogs, when pinched with cold, deep snows and wet weather, fall victims of death by smothering and suppression by the larger class being with the small ones. On all occasions hogs ought to be separated and classed according to size, and kept in the woodland pastures where they may provide shelter in the forest foliage. Every farmer should provide himself with hog houses in his wood-land pastures where they can get the foliage of the forest to make their beds. The best place for these houses should be selected on the south or north-east side of a hill, so as to receive the warmth of the sun in the winter, and on a moderate slope so as to drain off the water, and that the sun may the better dry and warm the earth. As to form I am not particular, but always recommend the shelter to be close and dry; to aid in keeping dry much care should be observed, in trenching around the house to turn the water.

Rearing a herd of blooded females swine; spring and summer treatment; breeding and winter treatment.—They should be left in a lot sufficiently large for exercise, containing plenty of water (for wallowing) and shade. If the grazing is not sufficient, I would advise a little corn, dish-water, slops and soap-suds, mixed together, to be given them, so as to keep the animals in a good healthy look, but by no means like fattening, to hurrying them in their growth.

My practice for winter treatment; after my sows are all pregnant, if practicable, I always have a large field of clover or meadow for their grazing, or put them on rye or wheat fields, and let them graze about 24 hours, twice a week, when the snow is off the ground; always providing a comfortable dry shed or houses for them, having a regular time for feeding (morning and evening) and if any animal stands in danger from the want of regular feeding while pregnant, it is the sow; and there is great danger of their being fed too much at a time, by careless or inexperienced servants, which is apt to produce abortions. Another cause is the severe weather on sows, snow and wet weather, when they have frequently to make their beds in the snow, and sometimes in mud and water—when shelters are not provided for them; this is the cause why we so often hear our farmers say all their sows have slunk their pigs, and shall have no pigs in the spring, and another cause still more particular I leave to the careful to observe; when my sows are half gone with pig, (sometime in February,) without fail I separate my sows and put them in lots (4 or 5 in number) to prevent from laying one upon another along in February and March cold snowy spells, which causes them, by oppression, to miscarry. This is the time that the greatest care should be taken with sows, as the period of littering is close at hand, for if they should miscarry, you have again to breed them, when their pigs will come late and much time lost.

Breeding of blooded sows.—When they have attained to the age of eight months or thereabout, my practice is to breed them between the 1st and 15th Dec., so as to make their littering to the latter end of March, and by having shelters or houses for their littering in, I can venture breeding sooner than I would otherwise advise. I can rear this litter and have my sows stinted to boar, and bring the second litter in and about the 1st and middle of September, so as to have time to rear them and so they will stand the ensuing winter. Then my sows can have about a month's rest until the 1st Dec., which I very much approve of for breeding again, and by so doing I have three litters in the period of 12 months. You now see the months I prefer for my blooded sows to litter, end of March and the 1st of April. The second litter from 1st to 15th Sept., and the 3d litter the latter end of March and 1st of April, which makes the period I have noticed. In stinting my sows to the boar according to the time mentioned, I have been very particular to aid my memory by committing to writing the time when they were stinted and the mode of stinting. I was in the habit of the old custom in my first beginning of doing business in this way. I soon saw there was an error some where, and my intentions were defeated some how—as I would reserve my lot of common sows to be bred in December, so as to bring the pigs the 1st of April when the weather was warm, and the old custom would be to let the boar go with some twenty or thirty sows, with the expectation of having a lot of pigs of one age, and in a common way there would come in season at one time in all probability one-third of the sows. Admit the boar to be in good health and a full flow of animal spirits and strength, he will soon by severe service be impotent, and consequently only the first few sows may be impregnated. The sows will in all probability continue to come in season, and the boar still reducing every day, and yet his lasciviousness keeps him incapable of being fruitful. Hence, I found by experience my sows were unproductive, some having two or three pigs, and they coming in much later than I expected, consequently I would recommend one boar to every ten sows, where you want all your pigs of one age and of good size. Of all the animal creation that I have any acquaintance with, the boar and ram will lose their juices faster from generating. I will aver that a boar may be in good health and high condition of animal spirits, and just let him with a lot of sows twenty or thirty in number, and in four weeks time he will lose one hundred pounds weight, and you may feed him with what corn he may want to eat.

My young maiden sows, I hardly ever permit to be served but one time; my reason for this is that the old boars are too heavy and strong for them; he mashes them down when they are willing; if not, he hunches them with his nose, and bruises them so much, that it impedes their growth forever afterwards. It is astonishing to think how they frequently support them. I disapprove under any circumstance of letting the male to a sow more than once when he is in good order. I recommend an aged male to maiden sows in all cases to secure large, sprightly, and well formed pigs, and more prolific. I have kept a true account heretofore of this practice. I let a lot of seven sows run with the boar until they have done with him and kept their several dates. I also had a lot of young and old sows. I let the boar out of his pound and let him serve them once a piece and kept their several dates. There was but one out of six that did not stand, and out of the lot of seven, there were two which did not stand. The lot of six produced from six to eleven pigs a piece, and the lot of seven did not produce as many pigs by four as the six. I kept both lots in the same manner with care, and they answered their several dates in littering, the period of gestation being about sixteen weeks. If you stint your sows to the boar only one time and you keep her in a lot to prevent other males, and she stands, she will be very sure to bring forth from 111 to 113 days; but if permitted to run with the boar when she is in season until she is done, I have recorded a number of instances and dates where they have varied from the set time of 111 to 116 days. This convinces me of the injury the boar sustains, and the sows receive no benefit. From his masterly strength she is constrained to do what nature does not desire, therefore the great discrepancy in the supposed period of gestation.

Particular feeding.—I always give my sows dish-water slops when practicable through the winter, in a trough, sufficiently long that they may all feed out of it without scuffling, with a pole confined on each end of the trough, and also to keep their feet out of the slop and keep them from fighting and slipping over the rotundity of the trough. The ammonia in the dish water will suit impregnated sows much better than strong salt. I had twelve head last winter in the severest weather and deep snows; I never gave but three ears of corn to each head, morning and evening, and when the snow was off, my feed was from one to two ears to each head, morning and evening.

Treatment.—When in some two or three days of their littering, I always separate my sows and put them in sheds or houses by themselves; I prepare leaves for their beds (if practicable) as I prefer them to straw or hay; they are light and warm and there is no danger of the young pigs getting entangled, as they do sometimes in straw; being very weak, they die before they get to the teat; now whilst confined before littering, give them two ears of corn morning and evening, and a plenty of water until they have farrowed. After they have littered, give nothing but water for 24 hours; then give two or three ears of corn night and morning, for some four or five days, never give rich slops for some four or five days before and after littering, for they are not in good health, but feverish, &c., and rich food will increase the fever, swell the teats, so that the pigs cannot draw them, more especially in warm weather. I have known instances of the milk entirely drying up from fever, and the pigs die for the want of it. Our affection frequently takes precedent of reason, by giving in to supposed calls of nature, therefore many feed their sows on the richest food immediately after littering. It also produces that very injurious disease among the pigs—scours.

Treatment after the pigs are some five or ten days old.—The sows should be kept separate from each other at least ten days after littering to secure the pigs affections to their own mother, and to prevent them in large herds of pigs from this evil, which is so common when the sows are permitted to run and litter together. The strong pigs will suckle all the sows, for their superior strength will force the weaker and younger from their teats, and consequently soon become puny and weak, which if kept as I have described, has a good bearing to prevent them. I can say from experience that every pig will have their own teat, and regularly as the sow calls or permits them to suckle, they will return to their own, unless forced away by the stronger. My practice is, after they have arrived at the age before mentioned, to put them in a lot of grass sufficient for their grazing and exercise, with a plenty of shade and water, if practicable, and always keep other stocks of hogs away from them of any size, for the purpose of keeping the sows from fighting and running over and crippling the young pigs, which is pretty generally the case if they are permitted to feed with the sows and pigs. I feed my sows while suckling with as much corn as they will eat up clean, and always if possible put the corn on smooth and dry ground for them. As for economy, from experience, I can say I am well paid for my husbandry, to have houses and sheds for winter feeding. My summer and fall feeding of slops to my sows while suckling their pigs is done in the following described manner.—Have two barrels or tubs placed convenient to the troughs, then put into each barrel two pecks of rye and one peck of corn meal, one of wheat bran, then fill the barrels with kitchen slops and soap-suds, when not enough of this, make up the deficiency with water, frequently stirring it with a paddle, and in 24 hours by a summer heat it will be about as acid as common still beer. Commence slopping out of one tub the first day, leaving some of the slop in the tub to retain the acid for quick fermentation; the same evening fill up this tub again for the third day; now commence slopping the second day out of the tub, and re-fill in the evening as you did the first; now you have both your tubs fermented and a body of acid in them, you must keep it up by filling one every day; renew the meal and bran every two or three days by putting in one peck of the three kinds mixed together in each tub, in the same proportion to the first put in. From this quantity I fed five aged sows and thirty-one pigs three times every day, which took about twenty gallons altogether, leaving in the tub about 12 gallons to fill up on. I continued slopping them in this way for seven weeks, which was about weaning time. In this time they consumed about twenty bushels, and at an average cost of 50cts. per bushel, they cost $10 expended in meal and bran. From these pigs I sold $310 dollars worth, leaving me some five or six pigs on hand.

Description of the Russia Hogs.—Their color is generally white, with long coarse hair, their head is long and coarsely featured, their ears are not so broad as the common variety of the country, yet longer and narrower, and come regularly to a point, projecting forward, andthey do not appear to have so much command of them as other breeds; they have fine length and height, their bone is large and fine, they stand well upon their pastern joints and trackers: quite industrious; they are thick through the shoulders, indifferently ribbed, (or suddenly inclined down) their plate or kidney bone rather narrow and ovaling than otherwise, hams pretty good, though not so good as the Irish, Bedford or Berkshire, yet preferable to the variety; they do not graze so well as many others; they want more time to bring them into market than the above named breeds. Give them from 18 to 20 months age, they will make very large hogs; they are quite prolific, their usual number is from nine to twelve pigs a litter. I have found their cross with the named breeds to be a valuable acquisition to their grazing, aptitude to fatten, and rapid growth at the same time.

Rearing, treatment and management of thorough bred male hogs.—To ensure good size, form and fullness in their hams, straight in their stifle joints, and to give a good and regular growth, I seldom or ever suffer my boar to serve a sow until he has arrived to the age of 8 or 10 months, and older if possible. I give them a lot sufficiently large for exercise, and give food enough to keep them in a high state of flesh while growing; by so doing, I have no fears, from past experience, of injuring their libidinous propensities as so much objected to by aged men, who pretend to be hog growers in Kentucky. By this mode, I am satisfied that you will have stronger, more vigorous, active and regular sized pigs in every litter; and further more, you will find your sows in littering are not so apt to produce pigs dead, *fitty* and feeble, as when got by a young or poor boars. In this way I breed them, and, according to my former view, never suffering them to run at large with spayed sows, &c. I believe by this treatment they will be good producers for ten or twelve years, if not longer. They are dangerous animals, and should not be permitted to run with horses and cattle.

This is the practice that I have adopted, and shall follow unless I see some further information from the pen of some other writer upon the subject. I am always open to conviction, and willing to receive instruction, and will not spare time, trouble and expense to procure correct principles. I should be pleased to see some writer who has the weight and benefit of years and experience on his side, that I might look up to, as a son to a father, for further information, as I am but yet in the morning of life. I feel much delicacy in coming out in the columns of a public agricultural work, but still, from solicitation, and as a friend to the cause of agricultural pursuits, I have ventured. We find recorded in the book of Genesis, chapter 3d, verse 23d, one of the first commands that God gave to man—"to till the ground from whence he was taken."

JAMES E. LETTON.

Millersburg, Ky.

ON OAT PASTURE AND IMPROVEMENT OF SOILS. BY WILLIAM YOUNG OF DELAWARE.

From Memoirs of the Philadelphia Agricultural Society.

Rockland Farm, March, 9th, 1810.

Sir,—In compliance with your request, made a considerable time ago, I have inclosed a narrative of the *oat pasture;* and several circumstances under which it has been introduced, with immediate advantage to the live stock and worn fields.

I have endeavored to copy it from the fields themselves; I have however, designedly as it were gone back, to give another view, of some circumstances which are deemed important, and not with a view to overcome your patience, but to remove doubts, and introduce the experiments before you, in a different point of view. The inferences respecting the advantages, or use of the oat pasture, have been, and still may be, deemed a whimsical expedient to spend money; it may be ridiculed by others. But as it has outlived, and overgrown every thing of that nature here, there is some hope that it may become indigenous elsewhere: it has been weighed for years under hopes and fears. Not that I dread criticisms, made under circumstances which offer a hearing, in a private, and before the public tribunal, on equal ground, foot by foot with the critic. It would give satisfaction to convince, or to be convinced. Improvement is the goal towards which I bend my course. If a new path shall be pointed out, and which has with greater advantage been trodden for several years, and with a greater number of simple facts to recommend it, it will be cheerfully followed. Otherwise the course now beaten by some years experience, cannot be abandoned.

I am most respectfully yours,
WILLIAM YOUNG.

GEORGE CLYMER. ESQ.
Vice-President of the Philad. Soc. for promoting Agriculture.

It is generally acknowledged, that the best land may be reduced to sterility, from an injudicious rotation of crops. It remains in a great measure to be proved, whether a farm, which from bad management had been rendered barren, can be restored to its pristine fertility, by a treatment not beyond the reach of every farmer, (nor without the farm,) who possesses the land, free from incumbrances, which are nearly equal to the supposed value of his worn-out farm.

When an inquirer examines the publications of those who have given the results of their experiments, it appears not only practicable, but easy: frequently however, some circumstance is not mentioned in the communication, or something not attended to by the reader, who intends to make the same successful experiments, but fails, from the causes stated.

The Rockland farm exhibited a subject for experiment, as it had not only been reduced by cropping, but generally, become a common for every animal, to take what remained of the scanty natural, but coarse herbage: having read in various books the result of sowing plaster and clover, it was presumed, that sowing plaster and clover would be the extent of the expenses required to fertilize the fields, in a few years;—a few experiments proved that the plaster and clover seed were both lost, as no one could at any season of the year, point out one field, or upon what part of any field they had been deposited, unless where the briers and bushes had been eradicated.

It should however had been mentioned, that the soil was generally a cold or heavy clay, some blue, white, light brown, and a few spots of red clay, loaded with hard blue stone and rocks, chiefly quartz, mixed with iron and copper. Some of the experiments were made with plaster, others were made by top-dressing with lime, at the rate of twenty-five or thirty bushels per acre: the lime was brought 20 or 25 miles from the kiln, and laid on the field at 25 cents per bushel: It was formed into a bed of about half a foot thick, and covered with earth ploughed and thrown over it, before it was slacked, that all the phosphoric principle disengaged by the water, might be united with the earth which covered it; a heavy harrow was afterwards passed over it, so soon as the shell was reduced to powder; the bed of lime and earth, was then frequently turned by the plough and harrow, until the whole assumed, the appearance, and smell, of soapers ashes, containing about ten parts of common soil, to one of lime. It was then carted, and spread regularly over the field, and in every instance it gave a return of clover, equal to ten loads of stable manure to the acre. The idea of mixing the lime and earth, was suggested from spreading the refuse mortar of lime and sand gathered from about buildings, and laid upon the field, the effect of which I observed was more immediate than any equal quantity of lime: though mixtures of lime and earth, were equally so,—in both cases, the lime was completely pulverized, and the sand and earth, broke up the communication of lime with lime, and the succeeding rains carried the fertilizing principle of the lime, as from a sieve, into the soil where it was spread,—it completely divided the soil, rendering that open and warm which before was compact, and too cold for the roots of the grain to live in.

The whole soil which before felt dead under foot, became so elastic that persons of observation by walking over the field in the night, distinctly told how far the lime and earth compost extended. The color of the soil was likewise changed into that of chocolate.

These effects presented several ideas, which had not occurred to me before: viz. That any thing which would separate the particles of the soil and admit the air, would render these cold and heavy clays, warm and fertile;—that the free intercouse of air, would carry off the acid; to meet this, ploughing in the fall was adopted, and found successful; one half of a field six years ago was ploughed in the winter, the other half ploughed in the spring; that part which was ploughed in the spring, has never brought grain, or grass, equal to the other. It should have been observed, that the field had not been ploughed for upwards of 20 years, and of course a great body of rubbish and roots were ploughed in, after the brier-hook and grubbing-hoe had smoothed the surface. Spreading of manure in the autumn, from the compost bed, has also been introduced with universal success, both upon grain and grass fields, the lye or salts, of the manure, being carried into the soil by the rains upon the breaking up of the frosts which have in some measure prepared the soil to receive it. High agricultural authorities, even bottomed on accurate observation, are opposed to the practice of spreading out manure in autumn; amongst these we find ,the justly celebrated *Lord* Kaimes, in his 'Gentleman Farmer' a work upon first principles,and deservedly of the highest authority. A departure from his judgment is only to be allowed, where facts would censure silence; nor should his name have been mentioned, unless to avoid the charge of writing without attending to what has been said on that subject; it is no conclusive objection that "the strength of the manures will be carried off by winter rains, or exhausted by the frost:" are not the warm showers more so, and are not the exhalations more copious in a warm than in a cold temperature; is the descending of the sap in trees no monitor, as to the season for spreading out manures, and about the operations of nature, for renewing, and *invigorating*, the process of vegetation.

Brier bushes, and all vegetable substances have been covered up with earth, rotted and used with the same success, as stable manure, and so far, and so long, as they separate parts of the soil and admit the air, they fertilize and change the color of the mould. These experiments tested by frequent repetition, have laid a foundation for experiments less expensive, and equally fertilizing, for the production of grass, and grain. ***Ploughing** and sowing, for the purpose of producing pasture and accumulation of vegetable soil, have been adopted:* for this purpose wheat, rye, Indian corn, (maize,) buckwheat and oats have been sown upon fields ploughed, which were incapable of producing any crop; none of those grains, have produced pasture and vegetable soil equally valuable, to that from the oats; where the others have failed, its roots have *pierced, disarmed,* and *vanquished* the *inhospitable soil,* and rendered it fertile; the winter ploughing is continued, and the oats are thrown in, as early as the season will allow, sometimes even in February, either upon what has been ploughed in autumn, or in the fields which were in corn the preceding fall. In general they afford early pasture, and when they are reploughed in July and August, and sown again with oats, they furnish excellent pasture from early in September, until late in December, during that season when all other pasture is generally dried up. The first sowing of oats only gives about two months pasture, but the roots and remaining herbage afford a manure for the second sowing, and this always yields four months valuable pasture,—which no other course known to me will afford—in September, October, November and December. Considerable attention is required to preserve the young clover, which the field will be able to raise in the second year of the oat pasture: if sown with the oats in the spring, the cattle should never be put in while the ground is too moist, as they would destroy and tread it into the soil; and sometimes dry seasons are also highly injurious to the clover. When the clover is sown with the second sowing of oats, the same care is required to prevent its being trodden in by the live stock for this purpose it is always necessary to have a spare field of oat pasture, which they will feed upon in wet weather, and which they would not relish in dry weather. To guard against a dry season it is most proper never to pasture the oats, where the clover is sown, so much as to prevent the herbage of the oats from giving shade to the clover. So soon as the field will produce clover luxuriantly, there is no farmer at a loss how to make his field as rich as he pleases, and having got them into good heart, it will be his interest to put them in such rotation, as shall increase the vegetable soil and consequent fertility of his fields.

It is almost unnecessary, to mention, what will make its way to the understanding of every farmer, viz. the many advantages gained from treating his barren field in this way.

1st. Early and late sweet pasture from such fields, which otherwise produced a scanty coarse herbage, unpalatable to every animal.

2d. Immediate reward for his labor; the stock are supported by it within two months from the time seed is sown: the two returns give six months green food; he is not however to depend upon it for all his summer pasture.

3d. Perhaps it is one of the most effectual means to root out garlick, because what have escaped the plough in the spring, are eaten down with the pasture from the first sowing of oats and prevented from going into seed: the ploughing in July and August expose so many of its bulbs to the sun, that few shoots are to be found in oats sown for fall pasture.

4th. It is an easy and profitable way of clearing grain fields from every species of injurious weeds; as it will convert them into vegetable soil, and enable the farmer to raise whatever grain or grass he shall judge most suitable to the soil.

5th. It will save the expense of a fruitless summer fallow, and the green herbage will aid the dairy.

6th. It enriches the farm from within itself, and no expense is required beyond the reach of any farmer: by rising one hour earlier, and working one hour later than usual, for two weeks, he may plough, and sow two acres, as an experiment. The pasture will recompense his labor, while his soil is greatly improved; it is equally evident, that the fertility of the soil is acquired, partly from the roots of the oats, opening the soil and introducing the air, and warmth of the sun, and partly from accession of vegetable soil produced from the decomposed roots of such pasturage; but even before the roots are converted into soil, they produced the most beneficial effects. Those from the spring sowing, retain the moisture, and supply the summer sowing with it. The roots from the fall pasturage, being full of sap, introduce winter frosts every where, into the soil, which swelling with the congelation, separates the particles; for it is to be observed, that roots while the stem is eaten down by the stalk, do not become hard, but are more numerous, than when the plant is matured into grain. It is however necessary to sow at least double the quantity of seed, to that required for crops of grain, the pasture being so much the thicker, and the increase of vegetable soil from the decayed roots so much the greater.

It is to be expected, that one or two repetitions of the series of oat pasture, will make the soil equally rich as a common dressing of stable manure, which from a farm of 100 acres, will not in general extend over more than 10 or 15 acres: this gives to one acre nearly the vegetable soil produced from seven or ten acres. It is to be remembered, that the object proposed was to render worn-out, or barren fields productive; and in no case have I found a field, which was not after two years oat pasture, capable of producing clover and receiving the gypsum with evident advantage. So soon as a field produces clover, no one is at a loss how to produce advantageous crops afterwards. It is in every one's power to estimate what the ploughing and seeding per acre of oat pasture will cost, and according to circumstances, so will the expenses be; but in general where the expenses are high, the value of the pasture is equally so, and if even granted that the cost of ploughing, and seeding, shall be double in value to the pasture produced, let the comparative value of the field be fairly estimated, before the course was begun, a waste, or worn-out field, and what it is now, when the course is completed, and laid down in clover, timothy or orchard grass.

It will be of the first importance to have at least two fields; otherwise if the cattle are constantly upon the same field it will not be found so productive, and in wet weather, they should be turned into some field where the herbage was too hard in dry weather. It will be eaten greedily by the cattle after they have been satiated with the soft blades of the oats; under this management, beeves have been fatted for family use and taken off in December, without any grain. It is observed that the oats scour at first, but the free use of salt readily corrects the complaint, and in no pasture do they rise faster in flesh; and the juices of their meat are uncommonly grateful.

The fields which have been in corn the preceding year have also been sown in the spring, without being reploughed, and have done equally well, except upon heavy clays, when the spring has commenced with heavy rains, which have rendered the soil too compact to be opened, even with a heavy brake harrow, drawn by four horses. The fields from the oat pasture the foregoing autumn, have also been sown, without reploughing, when the spring has set in without much rain, after severe frost: not only the oat pasture, but also the clover sown therewith, have answered well.

Oats have also been sown amongst the hills and drills of corn, after it has received the last dressing. It has succeeded, without any visible injury to the corn, provided care has been taken not to injure the roots, by the plough or harrow at the time the oats were sown.

It has been inquired, are not all crops of oats exhausting, if so, how can two sowings of oats in the same year, render the soil fertile? It is granted if oats shall be matured into seed, they will certainly exhaust; but if cut off, while in the blade, they, and all culmiferous plants, will fertilize. The experiment was made with Indian corn, sown broadcast, cut twice and carried to the stable, and a crop of turnips taken off the ground the same season: the manure was laid on before the corn was sown, but none was given when the turnip seed was put in.

Another way in which oats fertilize, appears to be from increase of vegetable soil; this is within the view of every observer: the remains of the pasture ploughed in, particularly in July and August is speedily decomposed, its tenderness and moisture aiding the dissolution. But dry stubble and husk roots are difficultly decomposed, nor do they produce so much carbonic or coally matter in the soil, which chemists say decomposes the water, and produces the air required to promote vegetation. As the vegetable is produced from air and water, and not from earth, which seems to be no more than a laboratory where the process of vegetation commences, and finally serves as a matrix to hold one part of the plant, while the other parts are raised aloft, in quest of superior aid, to complete the inscrutable operations of the vegetable fabric.

It has also been inquired, will this process of oat pasture fertilize every where? It is answered, that where the soil and climate are the same, the effects will be the same also. A description has been given of the soils, where the experiments were made, and are still going on. If experiments of the same nature shall be made upon a different soil, and climate, the result will be different, and more or less favorable, according to circumstances, and for which the practice now mentioned cannot in justice be rendered accountable. If my shoe fit my foot, I am warranted to say, it will suit a foot of the same size, and shape every where; let no one conclude, that it will fit a foot of larger or less size or different form; but I must confess that, passing over things equally obvious, I have run into numerous and expensive errors.

But when it is inquired upon what evidence it is to be received—the reply is at hand, living evidences, are at the command of every one who chooses to make the trial, let him however, be on his guard, against suffering himself to take a crop in place of the spring pasture oats.

If it shall still be inquired, how does the oat pasture fertilize? It may be also observed that the constant verdure and green herbage prevent the rays of the sun from parching the soil and depriving it of its moisture and air, both of which are highly necessary to vegetation. The double portion of juicy vegetable matter arising from the two crops of pasture in the summer, being every where united with the common soil partly mechanically and partly chemically, renders the soil capable of retaining sufficient moisture and elastic air, to make it open and warm, and by which the soil does not only become thicker by going downward, but actually expands, or rises, so as to give a furrow, considerably deeper than formerly, over immoveable rocks. Some years ago, a field in view of the farm-house, marked the broad rocks, during the course of every crop; they are now covered with so much soil, that they are seldom observed. The two ploughings also contribute to the increase of the the air in the soil, without which no soil can be fruitful, there being no vegetation in vacuo. Tull's horse-hoeing husbandry was introduced under the idea, that the *pabulum* of plants was pulverized earth; the fact daily before us is, that pulverized earth retains the *moisture* and *air*, as the handmaids of vegetation. Some experiments have lately been made, the results of which favor these remarks, viz. "that *soils* afforded quantities of *air* by distillation, somewhat corresponding to the ratios of their *values*."

Inclosed I have sent soils in the state they were found, before the courses mentioned were introduced.

No. 1. A sample of the unimproved soil about three inches deep.

No. 2. A sample of the same soil four inches deep, improved by the lime compost two years.

No. 3. A sample two inches deep from the field in its exhausted state.

No. 4. A sample three inches deep from the same field, which was once sown in pasture oats, and has been one year in grass sown after the oats, which did not take well, partly owing to the late season when it was sown, and partly owing to the seed having been injured, and the soil still cold.

No. 5. A sample two inches from an exhausted field.

No. 6. A sample four inches from the same field after pasture oats, which was followed by wheat, a poor crop, succeeded by oats, a middling crop, with clover which yielded a considerable swath last season; when the clover is ploughed in, it will be followed by pasture oats.*

HORSES SLABBERING.

From the New England Farmer.

Various opinions exist as to the cause of the excessive salivation that horses sometimes undergo, and which must detract seriously from their strength and ability to labor, as well as from their comfort. Some have supposed it to result from the second growth of grass that makes its appearance in July or August, the *euphorbia macalata* of the botanist; some to the second growth of red clover, some to the web of the spider that is spread so extensively over the latter feed of summer, and some to the action of the lobelia. We have had little doubt that it was to be attributed to this last cause, always feeling safe when our horses were in pastures where no lobelia existed, and when affected by it, finding them to be speedily cured by removing them from the fields in which it is to be found. In an Augusta (Me.) paper we find the following, which would seem to go far to confirm the belief that salivation is sometimes at least caused by this pest of our meadows and pastures.

"Our own family jade—a hearty kind old creature—has not enjoyed the luxury of grass for three years, and has always been kept in good trim on hay, with very little provender. In July we had the barn filled with her year's stock of hay, sweet from the field. Soon after the horse began to eat it, she commenced slabbering abundantly. Being quite out of patience, we set our wits to work to ascertain the cause. Some told us it was white clover, some said it must be lobelia. On making strict examination, we found that the last load put into the barn, had much lobelia, and but little white clover in it. As an experiment, we, for several days in succession, previous to feeding, were careful to cull the hay by handfuls, and pick out the lobelia. From this moment the slabbering ceased. On giving the hay again without picking it over, the salivation began again. So that we are satisfied that lobelia is the cause of slabbering in horses. Can any one tell us what will cure this slabbering, without the pains of separating the lobelia from the hay?"

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* The samples of soils sent by Mr. Young, exhibited the most marked difference. The progress from absolute sterility, to rich mould, might be traced by the appearance of color in the several parcels. I with great pleasure bear testimony on the subject of Mr. Young's improvements. In the years 1806 and 18 I saw cattle feeding in good pasture and good crops of grain, and grass sowing in fields, which in 1814 I thought totally irreclaimable from briers, garlick roots, and original poverty of soil. Where manure is at hand, and capital in the possession of the cultivator to purchase it, any soil may be rendered fertile; but Mr Young affords the best example of good farming, in enriching a naturally poor soil, and restoring fertility to exhausted land, by returning thereto its own produce raised with the least possible expense. J. M.

PLOUGHING AND PLOUGHS.*

From the Boston Courier.

Ploughing is considered by all farmers as the most important agricultural operation, either as it regards the immediate crop, or the future and permanent improvement of the soil. The farmer who so manages his field as to produce, in the main, the greatest reward for the labor and expense bestowed, will undoubtedly be considered as acting with a sounder discretion, than he whose sole object is a present crop, without regarding the permanent improvement of his fields. To deepen the soil, by bringing to the surface, at each successive ploughing, a portion of the poorer sub-soil, and thereby exposing it to the enriching influence of the atmosphere, and to cover up and preserve from washing rains and wasting winds, the light vegetable matter upon the surface, as well as to facilitate the subsequent operations of the husbandman, are the only important uses of the plough.

Our old fields are rapidly approaching to a state of utter sterility. At each successive rotation of crops, the vegetable mould is becomming thinner, and the product less; and the plough, in the hands of most farmers, so far from deepening the soil, and increasing its powers of producing, is really exhausting it of all its natural fertility; and will soon render it, as has already been done in some parts of our country by the same means, an unproductive waste, unfit for cultivation. The rich treasure, which our forefathers found upon the surface, which had been accumulating for centuries, has been squandered with a prodigal hand. The apparently inexhaustible deposite of vegetable food, which covered the land, has, by an improvident use of the plough, been given to the four winds of heaven, or washed away into the ocean. They have ploughed, cross ploughed, and harrowed, till their descendants have little else left than a mere *caput mortum.*

I have known rich swells of land in Maine, which thirty years ago, were covered with thick forests, and what would have seemed an exhaustless store of food for vegetation, by means of the plough robbed of every particle of vegetable sustenance, and now absolutely abandoned by the occupant as worthless.

Strange as the assertion may seem, it is nevertheless true, that farmers generally plough too much. The poorer sub-soil, which is turned up by the first ploughing, instead of being kept upon the surface, till it has become enriched by culture and exposure to the air, is by cross ploughing immediately turned back again into its cold and lifeless bed; and the light vegetable mould, instead of being keep beneath, for the benefit of the crop, is, by the same process of cross ploughing, brought again to the surface, and blown away by winds, or washed away by rains.

The manner of ploughing, and kind of plough, which is used by most farmers, have also a tendency to diminish the natural or acquired fertility of the soil. With ploughs but little differing in construction from common wedges, the ground is not turned over, but crowded into ridges, or the furrows lapped upon each other in such a manner as to expose much of its best properties to waste. The writer has ascertained from actual experiment, that on an acre of land yielding not more than a ton of hay to the acre, at the usual season of ploughing greensward, say the tenth of May, contains more than twelve tons of vegetable matter, consisting of the roots and tops of grass, and other vegetable remains upon the surface. Such a method of ploughing then as will be best calculated to secure, for the benefit of the crop, this mass of enriching substance, the farmer should not hesitate to adopt. By completely inverting the sward, and laying it as flat and smooth as the nature of the ground will admit, and then cultivating the sod with the application of a light dressing of compost, land may not only be kept in heart, but wonderfully improved. With one ploughing in this way, and spreading on one top-dressing of compost manure, of about twenty cart loads to the acre, and mixing it finely with the poor earth at the surface, I have raised two crops of grain or roots, and laid the land to grass. In the ordinary way of cultivating, four ploughings, as many times harrowing, and two dressings of manure, are considered necessary. I have then saved three ploughings, and as many harrowings, one dressing of manure, and at the same time have deepened, and permanently improved the soil, and more than doubled my crops. Ten years ago, I was upon the point of abandoning some of my old fields in despair. They had been cultivated in the usual mode of ploughing, cross ploughing and cropping, alternately under the plough, and in grass, and had become so impoverished, that the products were insufficient to cover the expense of cultivation. The same piece of land which gave me one ton of hay, will now at the same distance of time, after laying to grass, give me three.

In the cultivation of land, which has been a year or more under the plough, nearly the same course is to be pursued, especially when it is intended to sow wheat or rye; plough your land so as to turn under the rich mould, bring to the surface a portion of the fresh earth, that has never before been disturbed by the plough, and mix this well, (if the preceding crops have not been well manured,) with a light dressing of well-rotted compost, and from twenty to fifty bushels of slaked lime to the acre, and I am confident you will never require a legislative bounty, as an inducement to cultivate wheat.

Good ploughing cannot be effected without ploughs suitably adapted to the purpose. In this all-important agricultural implement, I venture the assertion, without fear of contradiction, that the Americans have made greater, and more useful improvements, in its adaptation and fitness for the designed purpose, within the last twenty years, than have been made in Great Britain for a century. From a conviction of the indispensable necessity of good ploughing to a successful tillage, near twenty years ago I persuaded the person who occupied the farm I now own, to send to England for an improved Scotch plough, (I think Small's,) which was highly recommended in the agricultural publications of that time. This was before the introduction of the cast iron plough into this part of the country. The plough came, and I must confess I was greatly astonished at the first sight of it, and as much disappointed when I witnessed its operation. A huge, misshapen combination of wood and iron, it was the laughing-stock of my neighbors, who at once denounced me as a "book farmer." The plough was laid aside, and has been kept for show, and in construction and workmanship, when compared with American ploughs, furnishes a striking illustration of the superior skill and ingenuity of our own mechanics, over those of Europe. I can now do twice as much work, and do it infinitely better, with Prouty & Mears' improved plough, with one horse, and a single hand, than a yoke of oxen and a horse, and one additional hand to drive, could do with the famous Scotch plough.

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*The auther of this paper is E. Phinney esq. an account of whose farming was inserted before—Ed. F. R.

Public attention was first awakened to the subject of improvements upon the old-fashioned, wedge-like plough, by the writings of Mr. Jefferson, who, in 1789, published his new theory of the construction of the mould-board, formed upon mathematical and philosophical principles. It was in consequence of a suggestion from him, that Robert Smith, of Pennsylvania, in 1803, substituted the cast iron for the wooden mould-board, for which he obtained a patent. This was the commencement of a series of improvements which have resulted in the substitution of cast iron for all parts of the plough, except the beam and the handles; and such has been the progress in reducing this implement to a fitness for the purposes designed, that the American cast iron plough, as now constructed, may in truth be considered, as it has been denominated, the most important instrument known to man. About fifteen years since the cast iron share came into general use in this part of the country, Wood's, Tyce's, Hitchcock's, Howard's and last of all Prouty and Mears', have each had their share of public favor. I have particularly attended to the operation of all these, and noticed the defects and excellencies of each. About twelve years ago, Hitchcock's plough, then in general use, and highly approved by the farmers of New York, was introduced into this state by Mr. Prouty, who was well acquainted with the practical use, as well as the construction, of the plough. His science in agriculture aided by his mechanical skill, from time, to times suggested to him various and important alterations and improvements in this plough, and about two years since, Prouty and Mears obtained from the government a patent for their "improved cast iron plough."

The prevailing difficulty with all ploughs, with the exception of the last named, is, that the force necessary in the draught, is not applied directly to the centre of resistance. Writers on this subject, as well as practical farmers, have erred in their notion, that the beam should be placed directly over the land-side of the plough, and that the cut of the coulter, or the position of the standard, should be square, or at a right angle with the cut of the share, thinking that if the share and coulter make an acute angle on the land side, the plough will incline to fall to the right. This would be the tendency, unless the other parts of the plough are so constructed as to resist and overcome this inclination. By so placing the coulter as to form an acute angle with the plane of the share, on the land side, the beam is brought more directly over the centre of the plough, as is the case with Prouty and Mears' improved plough, and thereby the power necessary to move it, is applied more directly to the centre of resistance, and the force required to move it, and overcome this resistance, is of course less than when applied on one side. I cannot better make my self understood, than by supposing the land, or left-hand side of a harrow, to be kept on a straight line with the line of draught. It will readily be preceived that the force necessary to draw it, when so placed, will be greater than if drawn in the usual way, by applying the draught to the centre. This is decidedly one of the most valuable improvements in the construction of the plough, that has been made in modern times, and for which the public are indebted to the ingenuity and skill of Messrs. Prouty and Mears. A greater ease of draught is not the only advantage resulting from this improvement. Another and perhaps greater benefit is its perfect adaptation to the end designed, by leaving the ground in the best possible condition. The acute angle, which is made in the land side of the furrow slice, by the peculiar construction of this plough, enables the ploughman to lay the furrows together, like feather-edged boards. This, in greensward, is very desirable, as the grass is thereby prevented from springing up between the furrow slices much more effectually, than when the furrows are cut at right angles. The grass is completely shut in, and will not rise to injure the crop, or increase the labor of cultivation. Not only in green sward, but in old ground, the superior manner in which the work is done by this plough is very perceptible. There is no tendency to crowd the ground into ridges; the soil is taken up, as it were and turned over, and left loose, and in the best state to derive vegetable aliment from the air, and to enable the roots of plants to penetrate, and strike down in search of food.

Another advantage attending the peculiar construction of Messrs. Prouty and Mears' plough, is its durability. When the resistance is all upon one side of the beam, there must be a constant tendency of the plough to the left, or land side; the friction is thereby increased in this part, and the wear, of course, is greater: but when the beam is placed more over the centre of the plough, and the resistance which it has to encounter is upon both sides of the beam, its movement is more regular, and the friction equal in all parts. These are some of the peculiar properties of this plough, which give it a decided preference to any other now in use. On conferring with some of my neighbors, relative to the work of Prouty and Mears' plough, it is believed, that in ploughing a field of ten acres, the amount of labor saved, added to the amount gained in consequence of the improved tilth, when compared with the work of any other plough, is fully equal to the price paid for it. E. P.

Lexington, (Mass,) March, 1838.

MISTAKE IN THE CULTURE OF THE BEET.

From the Farmers' Cabinet.

I am one of the root raisers—growing sugar beet, mangel-wurtzel, ruta-baga, and potato for feeding stock. And as farmers may, in my opinion, be as useful to each other by reporting their mistakes and failures, as their success, I will mention that my beets were flourishing, and the admiration of the public passing by them as late as the first week in the seventh month (July.) But the weather becoming hot and dry, and the ground harder than I liked, I concluded to run the cultivator through them and loosen up the soil. The consequence was, instead of improvement, the leaves began immediately to wilt, curl, and the edges of them to die; the mangel-wurtzel worse than the sugar beet; but all declined from that period until the late rains; at the present the original top is nearly all dead, and a new one formed, which bids fair to rival the first, if left to stand long enough. But it is supposed the root, although a pretty good size, has lost much in growth by the decay of the first top, and its maturity protracted, if indeed the crop be not much diminished. My inference is, that *late* culture, even if the weather be seasonable, may be injurious, by destroying the the fibrous side roots, which seem to be indispensable to the plant during its latter stage—and that consequently the earth should be kept in good tilth while it is young, and afterwards left alone.

The best crop of beets I have raised was in 1837, alternated between rows of corn; a full crop of the latter was obtained, (as was believed) and three hundred bushels of beets per acre besides; those in open patch a long side did not do so well; the shade of the corn seemed to be useful during the dry weather. I intend rerpeating this plan next year. J. Jenksns.

VEGETATIVE POWER OF SEA SAND.

A few days since a quantity of sea sand was carried out of Morecambe Bay, about a mile from the Furness shore. It had been, less than an hour previously, covered a considerable depth by the tide, and contained several cockles and other shell fish. It was immediately placed in pits or beds, fifteen inches deep, and sown, without manure or admixture of any kind—just in the state it was when taken from the bay—with wheat, barley, peas, mustard, cress, and radish seed. In five days the mustard, cress, and radish seed had sprouted, and begun to vegetate, having thrown out a considerable length of root, while (what is most extraordinary) the shell fish were even then alive! Thus have we wheat, barley, peas, mustard, cress and radishes, all growing, and cockles and other shell fish in a living state, in one and the same bed of sea sand! Should any one be at all incredulous as to the truth of this statement, he can easily try the experiment himself; an ordinary flower pot filled with sea sand, sown with almost any kind of seeds, would at once put the matter to the test. Common hay seed sown in October last in beds of sand similar to the above, and treated exactly in the same way, have now grown to the extraordinary height of 3 feet 6½ inches. Some wheat sown about Christmas last (now in ear) 3 feet 3 inches; barley do. 3 feet 3 inches; peas sown about April last (pods completely formed) 3 feet 3 inches. The farmers all around the Bay of Morecambe, in forming composts for their wheat and barley crops, use of sea sand about 26 carts (small one-horse carts,) lime, about four carts, manure, ten carts, per statute acre. Why use so great a quantity of sea sand if it does not possess very considerable vegetative power?—*Eng. Paper.*

REAPING MACHINE.

To the Editor of the Farmers' Register.

Talbot, Md., Sept. 14, 1839.

I send, herewith, two papers containing articles respecting Hussey's wheat reaper. One of them (the report of the committee which tried it near Philadelphia) is so full and satisfactory that I deem any further description of it, by me, as requested, even if I were competent, altogether unnecessary. From my experience in its use, of three years, I am of opinion they have not said in its favor a single word too much.

Saml. Hambleton.

REPORT OF A COMMITEE OF THE PHILADELPHIA AGRICULTURAL SOCIETY, ON HUSSEY'S REAPING MACHINE.

The committee appointed at last meeting, to superintend the operation of Hussey's Reaping Machine, beg leave to report:

That they discharged the duty of their appointment on the day following the same. They met for the purpose on the farm of Mr. John Fox, in Oxford township, where the machine was put in operation in a piece of several acres of heavy wheat, considerably lodged—and contrary to the expectations of most of the committee, it performed remarkably well.

The machine requires two horses to draw it, a boy to drive them, and a man to push off the grain. It is not material whether the speed be a walk or a slow trot, though a walk, where the grain stands tolerable fair, is to be preferred. A trot is sometimes necessary where the grain is much lodged, or a strong wind drives in the direction of the machine. It operates very satisfactorily in grain so much fallen as to be entirely beyond the ability of the cradle; and the grain is generally laid fully as regularly as by the cradle, with the advantage on the part of the machine, that it is laid in heaps ready for binding, thoreby saving much labor in thin crops, and rendering a rake unnecessary. So perfect did the machine perform, even in grain considerably lodged, and in which a cradle could scarcely have been used at all, that not a stalk was left standing, while the stubble presented one uniform height of about seven inches throughout the field. The loss, too, by this mode of harvesting, is greatly reduced. The machine operates somewhat on the principle of the common shears, requiring nothing of the momentum of the cradle; and the only jarring attending it is from the weight of the grain falling on a smooth surface. The wheat cut on the present occasion, was dead ripe, having been standing two weeks longer than necessary, and yet scarcely a grain could be found shattered out.

It is estimated by the committee, that the ordinary performance of this machine is from ten to twelve acres per day; although they fully believe, that, on an emergency, it could accomplish twice this amount of work. In confirmation of this, they would state, that it cut, on this occasion, six hundred and thirty square yards in two minutes, doing its work in the most perfect manner. It requires from six to ten persons, according to the state of the crop, to bind up or remove the grain as fast as cut, which it is necessary should be done to prevent it from being crushed by the horses and wheels of the machine, on the succeeding through. The machine is not liable to get easibly out of order; and the cutters, although they are very readily sharpened, seldom require it, as more than one hundred acres of grain, according to the statement of Mr. Hussey, had been cut by those attached to this machine, prior to the present occasion.

Upon the whole, the machine did its work remarkably well, where it was possible for any thing except the naked scythe to penetrate—and so far as the commiitee could perceive, to the entire satisfaction of a number of intelligent farmers present on the occasion, most of whom were, at first, not a little skeptical of its utility.

Your committee would say, in conclusion, that they believe the reaping machine of Mr. Hussey, to be an advantageous substitute for the present mode of cutting grain on large farms, or where two or three adjoining farmers of the ordinary amount of land in this vicinity unite in using it—the price of one being one hundred and fifty dollars. We would therefore recommend it to the attention of this society, and the agricultural community generally,

K. SMITH,
JOHN FOX,
JACOB SHALLCROSS,
P. R. FREAS.

For the Farmers' Register.

THE MATURING OF CORN HASTENED BY EARLY CEASING TO CULTIVATE THE GROWING CROP.

I avail myself of a rainy hour to return your philosophical correspondent, Senex, my hearty thanks for his very beautiful explanation of the manner of the acting of plaster of paris upon limed land; time *may* prove him right in his speculations, but right or wrong, I thank him. The man who cultivates his racionating faculty has always been more in request than he who cultivates that of discrimination. Without much care for the philosophy of this matter, it is my purpose to push the facts to all useful extent. I think that it was that singular, yet great man, Napoleon, who said that "if he gave ear for one hour to the philosophers of his court, his dynasty would not last three days." Perhaps a *mere practical farmer* has as little to expect from philosophy as Napoleon; in practical life it is a great matter to think correctly; but to apply those thoughts *usefully*, is not a matter of less importance.

I have another curious fact to state in relation to my corn crops. The land was turned with a good plough and two horses, then checked at right angles, 4½ feet square, and planted from the 4th to the 10th of April. It was then cultivated with the common cultivator, and once cleaned with the hoe around the plants. Upon the 16th of June, I withdrew the labor of cultivation to the harvest field, and was unable afterwards to pass my horses through the rows without breaking off the shoots. Upon the 10th of August it was ready to be stripped of tops and fodder. Now my immediate neighbors planted at the same time, and ploughed their corn four times; mine was mature full three weeks before theirs; now here is a fair case for philosophy.

I am now burning shells for the second application to my fallow of 60 bushels per acre, the first having been made three years since. Clover seed is for the greater part a failure, owing I presume to the cloudy wet weather. This will compel me to take successive crops from the same land; an odious practice, except in the mountains and upon their best land.

I have stated the facts having relation to my corn crop, believing that the saving of three weeks in the cultivation is a matter worthy of notice. My obliging friend Senex may be able to account philosophically for the rapid maturation of the crop. If time be money, not less than $100 was saved in the cultivation of the crop, and I entertain the belief that the crop has been made without injury to the land; that is, that a summer fallow would have been as injurious as my crop of corn, or more so. What should be done with weeds from two to four feet high, covering all my wheat stubble? Nature's course is onward; are they the means she uses for that purpose under the influence of lime?

A FAIRFAX CULTIVATOR.

We presume the weeds which have succeeded the growth of wheat, are annuals, (as carrot weed, crop-grass, &c.,) which will not appear next year, and keep the land foul, but will yield their place to some other crop in *nature's manuring rotation.* Nothing is required but to *let them alone*, and they will serve to top-dress, and enrich the land; and first to protect and next to manure the next year's clover, if clover be already sown, or if *not*, such other crop, natural or artificial, as may *succeed.*

ED. F. R.

ON THE VALUE OF SUN-FOWER SEEDS FOR OIL.

To the Editor of the Farmers' Register.

Athens, August 25th, 1839.

Although a stranger to you, I take the liberty of addressing you, upon the subject of the *sun-flower plant*; knowing that you take a deep interest in any and every thing connected with agriculture, &c. For the last five years my attention (mental I mean,) has been at times occupied on the merits of this plant, as a valuable addition to, if not a supersedent of our oils, now in general and unavoidable use. I have used the term mental, because I have expended much more of thought than manual exercise upon the subject. From the limited trials made, however, both in the culture of the sun-flower, and the home-made extraction of the oil, and the results in its use for domestic purposes, I am compelled to believe, that the oil extracted is equal if not superior to any other now in use; answering the place of olive oil, for the table, and spermeceti, and all other kinds now in general use, for all the requirements of painting, lighting of lamps, &c. &c.

This may appear a very broad assertion to those who have for the first time had the subject brought to their view, and to others who have fallen into the received opinion, that the oils now in use are the best, because they answer the immediate wants and requirements; not reflecting that it takes two or more of these specific kinds and qualities of oil, to supply the necessary wants and uses—when this oil, if properly cultivated and prepared, will answer, if not take the place of all others put together.

A grand desideratum, and which ought not to be lost sight of, is, that for lamps, it burns as long, gives a clear and more brilliant light, exhales no disagreeable or unhealthy odor, no apparent smoke evaporates from the wicks, and consequently leaves none of those dark and unsightly features of soot attendant upon even our finest oils now in use. All of which, without the aid of philosophy, is apparent to even the most careless observer, to be detrimental to the health of families thus using them, and repugnant to the olfactory nerves.

These remarks hastily put to paper, is intended to draw from you any information or experience you may be possessed of in regard to the sunflower plant, for the purposes here mentioned, or as food for stock or poultry; and you will confer a singular favor upon me, by letting me hear from you on the subject so soon as convenient.

With respect,
N. A. Adams.

We have no experimental knowledge on the subject of the foregoing letter; and request that any information possessed by others may be afforded through our pages. In the agricultural and other papers, sundry articles have appeared, within the last twenty years, recommending the oil of the seeds as a substitute for olive oil. But, so far as we know, there has been no statement of practical results, or of cost and profit.—Ed. F. R.

A BIRD STORY.

From the Cultivator.

Milton, Ulster co. N. Y. July, 1839.

Friend Buel.—I would not have ventured to forward the following statement, were it not that the narrator of it, Edward Hallock, of the firm of Wm. Hallock & Brother, of Milton, Ulster, co. is known to thee, and known to be of unquestionable veracity. I have heard him before express his conviction, that if birds were protected and cherished by farmers and others, we should never be subjected to the loss of corn or other crops by grubs; and that other noxious insects would be sensibly diminished. There is a small kind of bird (the males nearly black, the females brown,) that is noted for being around and following cattle in the field, as in the case I am about to detail. Mr. H. says, "on the 26th of the present month, I was ploughing for turnips, myself with one team, and my son with another; and observing that we were followed by a flock of the above little birds, I took it into my head to notice their motions, to ascertain what was the attraction, when I perceived that their object was grubs. We ploughed up plenty of a small white, and a large brown or gray grub, as well as some in a chrysalis state, and angle worms; all of them, *excepting angle worms*, appeared to be acceptable to them; and as the sequel will show, they were capable of devouring large quantities. I should think that one would make way with at least 100 per day. I cautioned my son against making any motion towards noticing them, in any way to intimidate them; as I found they grew more and more bold in their honest avocation, and as the land diminished in width, they would remain in the opposite furrow when not more than three or four feet distant. At length my son spoke cautiously, and said there was one on his plough beam. I then stopped the teams and told the boy to pick up a grub and throw it to the bird that had distinguished itself by its tameness. He did so; and the bird immediately seized it. Encouraged by this, I told him to pick out the next white one and hold it out in his fingers near the ground; crawling down, he did so, and the bird came and picked it out of his fingers! Afterwards he stood up and held out one, and the bird lighted on his hand and picked out the worm. This was repeated until it lighted on my own hand; I raised it up and applied my cheek to its wing without frightening it away. The next day he was not slow in finding us, and practised the same familiarity, in presence of James Sherman, William Hallock, and others of the neighbors; it came into the corn field where the boys were weeding corn, and actually, without any special attraction, perched upon the head of one of the boys; it continued these visits until one of the boys in an adjoining field, could not repress his inclination to seize and hold it. This made him more wary, but he gradually recovered his confidence." I communicate these facts in the hope that they may contribute to produce an examination into the subject, of how far it would tend to the agricultural interests, to fall upon some method to tame and familiarize small birds, instead of frightening, maiming, or destroying them. E. Hull.

TO CURE WOUNDS ON HORSES AND CATTLE.

From the Genesee Farmer.

Mr. Tucker—I became a subscriber at the commencement of the 3d. volume of the Weekly Farmer, and in the first No. of that volume, I found a recipe to cure wounds on horses and cattle, which alone has been worth more to me than ten years' subscription, and I think it would confer a favor on thy patrons to republish it in the present volume.

Silas Gaylord.

Skaneateles, 7th mo. 26, 1839.

The following is the receipt alluded to, in the above note of Mr Gaylord:

As there are many useful receipts hidden from the public, for the sake of speculation in a small way, by many who would be thought something of in the world, I am induced to lay before the public a recipe for making KING OF OIL, so called, which perhaps excels any other for cure of wounds on horses or cattle, and which has long been kept by a few only in the dark. Feeling a desire to contribute to the good of the public, but more especially to the farmers of Genesee, I send you the following very valuable recipe for publication:

1 oz. of green copperas, 2 do white vitroil, 2 do common salt, 2 do linseed oil, 8 do West India molasses.

Boil over a slow fire fifteen minutes in a pint of urine; when almost cold, add one ounce of oil of vitrol and four ounces spirits of turpentine.

Apply it to the wound with a quill or feather, which will immediately set the sore to running, and perform a perfect cure. Yours respectfully,

STEPHEN PALMER.

Middlebury, Dec. 10, 1832.

PRICES OF STOCK IN KENTUCKY.

From Capt. Marryatt's Diary.

Of the cattle show of Lexington, (Kentucky,) the fourth day was for the exhibition of jackasses of 2 years and 1 year, and for foals and jennies also; this sight was to me one of peculiar interest. Accustomed as we are in England to value a jackass at thirty shillings, we look down upon them with contempt; but here the case is reversed; you look up at them with surprise and admiration. Several were shown standing fifteen hands high, with head and ears in proportion; the breed has been obtained from the Maltese jackass, crossed by those of Spain and the south of France. Those imported seldom average more than fourteen hands high; but the Kentuckians, by great attention and care, have raised them up to fifteen hands, and sometimes even to sixteen. But the price paid for these splendid animals, for such they really were, will prove how much they are in request. Warrior, a jackass, sold for 5,000 dollars, upwards of £1,000 sterling. Half of another jackass, Benjamin by name, was sold for 2,500 dollars. At the show, I asked a gentleman what he wanted for a very beautiful female ass, only one year old; he said that he could have 1,000 dollars, £250, for her, but that he he had refused that sum. For a two-year old jack, shown during the exhibition, they asked 3,000 dollars, more than £600. I never felt such respect for donkeys before; but the fact is, that mule-breeding is so lucrative, that there is no price which a very large donkey will not command. I afterwards went to a cattle sale a few miles out of the town. Don Juan, a two year old bull, Durham breed, fetched 1,075 dollars; an improved Durham cow, with her calf, 985 dollars. Before I arrived, a bull and cow fetched about 1,300 dollars, each of them about £280. The cause of this is, that the demand for this stock, now that the western states are filling up, becomes so great, that they cannot be produced fast enough. Mr. Clay, who resides near Lexington, is one of the best breeders in the state, which is much indebted to him for the fine stock which he has imported, and I quote the prices: Yearling bull, 1,000 dollars; do heifer, 1500. Cows of full Durham blood, but bred in Kentucky, 1,245 dollars; do. 1235 dollars. Imported cow and calf, 2,100 dollars. It must be considered that although a good Durham cow will not cost more than twenty guineas perhaps in England, the expenses of transport are very great, and they will generally stand in, to the importers, about 600 dollars, before they arrive at the state of Kentucky.

EXTRACT FROM AN OLD AUTHOR, CONCERNING MILDEW IN WHEAT.

To the Editor of the Farmers' Register.

Looking over old Fuller's 'English Worthies' last evening, I was so amused at his 'Farewell to Middlesex,' that I have transcribed it, thinking it may serve to fill up, in an interesting way, some spare corner in the next number of your valuable journal. Yours, S.

"This county," says he, at page 47, vol. 2, "is much infested with *mildew*. That it is, I know to my cost; but could not purchase the *knowledge* what it is, much less how it might be *prevented*, at the same price, though having diligently enquired into the name and nature thereof.

"Some will have it called *mildew, quasi maldew* or ill-dew; others *meldew* or honeydew, as being very sweet, (oh! how lushious and noxious is flattery!), with the astringency thereof causing an atrophy or consumption in the grain. His etymology was peculiar to himself who would have termed *mildew*, because it grindeth the grain aforehand, making it to dwindle away almost to nothing. It falleth (be it mist or dew) when corn is almost ripe for the sickle, and antidateth the harvest (not before it is welcome, but) before it is wished for by the husbandman, grain being rather withered than ripened thereby. If, after the fall, a good rain, or strong wind cometh, it washeth and wipeth it off, so that no mischief is done: otherwise, the hot sun arising, sealeth (to use the husbandman's phrase) the mildew upon the straw, and so intercepteth the nourishment betwixt the root and the ear, especially if it falleth not on the *hoase* (which is but another case, and hath another tunicle under it) but on the stripped straw near to the top of the stalk.

"Grain growing under hedges (where the wind hath least power) is most subject thereunto, though wheat of all grain is most; bearded wheat of wheat is least liable unto it; not that *the haurnes* thereof *are spears* to fright the mildew from it; but *advantageous gutters*, to slide it away the sooner which striketh on rotted or pollard wheat.

"*Inland counties*, Northamptonshire, Bedfordshire, &c. complain the least; *maritime* the most, of mildew; which insinuateth *the vapors of the sea* to be casuall thereof; some hold that, seeing that, it falls from the skies, earth hath no guard for heaven's blowe, *save praier*, which in this very case is prescribed by Solomon.[*] But others conceive, that humane may be subordinate to spiritual means; to prevent not the falling but the hurting of this dew in such a degree, and hopefully expect the remedy from the ingenuity of the next generation.

"I am the rather confirmed in my hopes, because a help hath been found out against *the smooting* of wheat, at least wise in some good proportion; I say the smooting of wheat, which makes it a negro, as mildew makes it a dwarfe; viz. by mingling the seed with lime as your husbandmen will inform you.

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[*] 1st. Kings, viii, 37.

"And for my vale to this county, I heartily desire that either God would of his goodness, spare the fruits of the earth from so hurtful a casualty, or put it into the minds of men (if it may stand with his will) to find out some defensitive in some part, to abate the malignity thereof."

LETTERS FROM AN AGRICULTURAL APPRENTICE TO HIS FATHER.

(Continued from page 512.)

From the (Edinburgh) Farmers Magazine.

Class III.

July 23.—Since my last, a material change of weather has taken place, which occasioned much positive loss in the first instance, and a great deal of additional labor afterwards. It is under such circumstances that the judgment and activity of the farmer comes to be most completely ascertained; because the derangement of his usual plans throws every branch of work out of shape, and causes a resort to measures of expediency or of a temporary nature, In such a situation Mr. Jamieson shines conspicuously. His mind seems stored with resources for every emergency, and the difficulty of the case appears to give increased strength to his natural powers. He shapes his conduct to the circumstances under which he is placed, constantly preserving the greatest order and regularity.

Last week a violent and continued rain for twenty-four hours occurred, which, to a certain extent, floated the fallow field, wetted the hay ricks, stopped the thinning and cleaning of turnips, and lodged at least one half of the corn crops on the farm. With such a number of people, many farmers would have been thrown into utter confusion, or at least one half of those below them would have remained idle, while others would not have been much more profitably employed. Not so with Mr. Jamieson; for the rainy day was as throng a one as ever I saw since I came here. The several inventories were examined, and deficiencies noted down with the greatest accuracy. Two pair of fanners were set to work in dressing of corn. The lofts were sweeped, dusted and cleaned; in short every one was sedulously employed. When the rain ceased, my whole *corps* were instantly despatched to the fallow and turnip fields, and express orders were given me not to suffer a drop of water to stand on any of them; of course I had not a dry foot while in the field, but fortunately was not the worse of this treatment, having taken care to shift regularly after working hours. When thus employed, Elliot and his ploughmen were busy in removing dung from the farm-yards, and middening it in a regular manner on an adjoining field of grass-land, where it is to be used next winter; and as two hundred bolls of wheat had been lately sold, Mr. Jamieson took this opportunity of delivering it to the merchant. Even Howard and his herds were not idle; for, as several markets were held at the time, he and they were seldom at home at this troublesome period. The thrashing machine was likewise so busily employed after the weather settled, that our stack-yard has become nearly empty.

Every thing seems now to be restored to order except the hay, which will give us a little trouble before it can be safely stacked. Mr. Jamieson says it has received damage which cannot be cured, and that I will soon see the extent of injury done to hay, by a fall of rain, while in the cock. He adds, that it is much less hurt by wetness during the early stages of the winning process than when in the cock; because the natural fermentation which necessarily takes place is then reinforced by artificial auxiliaries, consequently that a degree of putridity ensues, inevitably injurious to the article. Fairbairn has returned to the turnip field; and the young plants being all thinned and set out, he is going over them a second time, correcting former errors, and destroying every weed that has recently vegetated.

August 4th.—The hay is now safely stacked, though a good deal of work was required before we got it into such a condition as to satisfy Mr. Jamieson. Three days ago, when fine sunny weather and gentle wind prevailed, our united strength was employed to take down the cocks and expose the wet parts to their beneficial influence; after which the whole was re-cocked, great care being taken to mix the external and internal parts together, so as the quality might be equal, and any moisture remaining in the damaged parts absorbed by what was in good condition. It stood for the night in these new made cocks, but next day promising good weather, the carts were set to work about nine o'clock, and in that and the following day the whole was got into the stack-yard. It is put up in two stacks, each containing about five thousand Scotch stones, or fifty-five English loads. The charge of superintending the loading of the carts was committed to me, and I had full proofs of the truth of Mr. Jamieson's previous opinion respecting the damage; those parts of the cock that were wetted, though made perfectly dry, breaking with the slightest touch, and appearing altogether devoid of substance. Mr. Jamieson says the damage will not be so apparent after the stack-sweat has ensued, though perhaps he means that the partial damage, being thus transferred to the whole stack, will not be so discernible as when confined to a certain portion of it. The stacks are to be immediately combed down, completely covered with straw and hard roped, so as they may be secured from the storms of winter. I observed that where clover was most plentiful, the hay had suffered most; and, *vice versa*, that the cocks containing the greatest quantity of rye-grass were least damaged. Had the cock been of clean clover, I am almost sure that it would have been fit only for the dunghill.

August 10th.—The fallow is now dunging, and four heads of carts, or sixteen altogether, are employed at that business. Each head requires two men to fill, and one to pull out the dung from the cart, while the carter drives the horses regularly forward; and one man and three women spread the heaps laid down by each head of carts, so that thirty-two men and twelve women are thus employed besides the overseers. My post is at the dunghill. Elliot looks after the carts in the field, and sees that the dung is properly drawn out, while

Fairbairn manages the spreaders. We just take out sixty loads a day per head, or two hundred and forty loads altogether. Fifteen of those loads, or thereby, are applied to an acre, Scotch measure; and as each load, from trial, is found to contain a trifle more than one yard and a half of cubic measure, you may have a tolerable notion respecting the extent of the application. In this way we dung about sixteen acres per day, so that in little more than six days the whole hundred acres of fallow will be gone over. Mr. Jamieson is very exact about the spreading, asserting that the benefit of the application depends in a great measure upon the accuracy with which this process is executed; or, more plainly speaking, that fifteen loads, well spread, are of as much use as twenty loads imperfectly separated and divided.

The turnip fields are now completely finished off, and present a notable prospect to the amateurs of good husbandry, having very few blanks, and containing scarcely a single weed. The ruta-baga seemed shy of growing for a long time; and, though now more forward, still presents more naked soil than the yellow and white turnip. The horse, or yam potatoes, show a strong foliage, and perhaps will ultimately be found to return as much root as the ruta-baga. All our corn fields are looking well, and some of them are holding out signs for the sickle, especially the early oats, and first sown barley. Mr. Jamieson has intimated that I am to assist in the field; and given me warning that to oversee there, is a post of no little trouble. He has gone the length of declaring, that the corn farmer must be a slave during the harvest quarter, if he wishes his affairs rightly managed; so I easily understand, if the master is a slave, that his deputies cannot be characterized as filling a much higher station. I shall, however, endeavor to do my duty, trusting that the after advantage will compensate the expense at which it must be gained. Every principle connected with honor and interest call for exertion on my side,—especially as Mr. Jamieson has never ceased to treat me with urbanity, and more like a son, than one sent to learn husbandry under his inspection and direction.

August 20th.—Harvest has partially commenced, though, not having as yet drawn out our whole strength, Fairbairn has only been employed in the management. Next week that important branch of rural economy will be undertaken in earnest, when Howard and I are to be called into action. Elliot is reserved for his horsemen, who, I understand, are rarely taken to the field unless there is a deficiency of hands. At this time he is throng ploughing down the dung put on the fallow field, which works in a capital style; and on this furrow it is meant to sow the wheat seed about the end of September, providing a fresh growth of weeds does not appear before that period. The stack-yard was lately emptied and cleared for the new crop. My squad are making straw ropes for tying down the thatch used in covering the stacks, and every thing is arranging as fast as possible, so as interruptions may be avoided in the great work before us.

September 2.—The past week has been a busy one; and I seize upon a leisure hour, allowed by a heavy shower falling, to acquaint you of our proceedings. On Monday morning, our forces were mustered for harvest work, and were divided into twelve bands of twelve shearers, and two bandsters each, four of which were committed to the charge of Fairbairn, the like number to me, and the remainder to Howard, our head shepherd. The ranking or sorting of the people was done with expedition by Mr. Jamieson, who seems quite up to a matter of that nature; and though half an hour or thereby might be lost before the ranking was completed, yet all that hurry and confusion which, without it, would inevitably have ensued, were altogether kept clear of, and the whole regiment entered to work at once upon a horn being sounded by Fairbairn, who is first in command below Mr. Jamieson. The arrangement was made in this manner.—Mr. Jamieson having ascertained his numbers, selected twelve of those he considered to be the best shearers, and provided them with two able bandsters for tying and stooking the corn; ordered Fairbairn off with these, and to place them on the left or open side of the field, four shearers upon each ridge, with their bandsters behind them. The second, third and fourth bands followed in their course, a ticket being given to each bandster mentioning the band to which he belonged. When the fifth band was formed, I marched at their head, and placed them on their respective ridges, and so on, as the sixth, seventh and eighth band arrived. Howard came with the ninth, and arranged them in like way, and Mr. Jamieson followed with the rear guard. After riding across the field, and being satisfied that all were rightly arranged, he halted in the centre of Fairbairn's hands, and calling *attention*, he stated, in a few words, that these people were committed to his management, and that full power was delegated to him to do every thing which, as a master, he could do himself; that it was his desire to have the corn clean and low cut; and that, while sufficient time was allowed to execute the work, idleness was on no account to be permitted. He then came to my station, and repeated these orders, and concluded with the same in the centre of Howard's division. After this, upon a sign being given, Fairbairn sounded his horn, and immediately the whole body fell to work. The total number were 144 shearers, and 21 bandsters. Three fourths of the former are women, who, in fact, are our neatest cutters. The corn of each band is brought into the middle ridge, and stooked there; a measure which Mr. Jamieson says forwards the loading of the carts considerably. Indeed, independent of this consideration, the less compass that corn can, in the first instance, be put into, so much the more will the stubble be kept clean. Every bandster is directed to draw the bottoms of the sheaves, and to gather up any heads which drop out when he is tying them; so that the quantity left is very trifling.

We had a good deal of drilling the first day, and not a few were dismissed the service as unqualified. These were constantly replaced from a supplementary corps which remained at home, and, before night, our discipline was tolerable perfect. Mr. Jamieson, who commanded in chief, when he noticed any one not working to his mind, always addressed such in a calm but steady manner; explained how he wished his work performed; and requested, if they were incapable of doing what he required, that they would give up without further trouble. About a dozen left us in the course of the first day, who were always paid for the time they had wrought, but no more. The hours here are from sun to sun, with an hour for breakfast, and the like time for dinner. Twenty minutes rest are also allowed both in forenoon and afternoon. The victuals are brought to the field in three carts, one for each division; and the bandsters of the different bands act as distributors, after the portions are measured out or set apart for each band by the person who drives the cart. The breakfast consists of oat-meal pottage and milk; at dinner, bread and beer are given; and for supper, the like allowance as at breakfast. Fairbairn thinks that it has taken a day of six shearers to cut an acre of wheat; and if so, twenty-five acres have been cut each day. I suppose he is not far from the mark; for we have worked four days and a half, and done little more than cut down the fallow break of one hundred acres. The field presents a fine sight, as it is wholly in stooks of twelve standing sheaves, with two for hoodings or covering the top. A man goes regularly through the field to set up such sheaves as may have fallen down; but should the weather prove dry, it will be carted to the stack-yard in a day or two. The oats and barley cut last week, under Fairbairn's inspection, will also then be ready. The barley lay untied for three days. which was of great benefit in the winning of it. When tried up, it seemed perfectly dry, but Mr. Jamieson says he is always apprehensive of barley heating in the stack, as the softness of the straw allows a degree of compression apt to be followed by a heat dangerous to the grain. I understand it is customary with him to examine every field before the carts are sent to bring any home; and that he is particularly careful to carry none till completely winned. Indeed, when stacks so large as those I saw last year are made, the greatest attention must be necessary, otherwise heating, particularly of barley and beans, could not be avoided. This attention is too often disregarded, many people thinking they ought always to carry when their neighbours are so employed, without reflecting that the winning process is regulated, not only by the ripeness and cleanness of the crop when cut down, but also by situation and size of sheaves. A small sheaf wins in half the time that is called for by a large one, and dries much faster after being completely wetted. All these circumstances should be considered by the farmer before he carries; and on no account whatever should a previous personal examination be omitted. To spoil corn in the yard is a most disgraceful affair to the farmer; though, disgraceful as it is, perhaps it happens oftener than is known. Mr. Jamieson, however, assures me, that it is now much less frequent in the country than formerly, when the crops were fouler, in consequence of the imperfect rotations then practised; also, that the size of sheaves is of late greatly diminished, which permits the winning process to go more speedily and equally forward.

Elliot and his ploughs are seed-furrowing the fallow field, and will be well through with it by the time that the loading of corn commences. The ridge is neatly gathered up, great care being used not to raise it too high in the middle. The horses are supported on green tares, which are in full pod, and appear to be nourishing food. Mr. Jamieson says, no kind of food is better in dry weather, especially if free from rottenness at the root. They are all tied up in bunches of the like size as those of clover; only, I observe, that each horse gets three per day, instead of two of clover; owing, I presume, to the latter being generally more stuffing in the stomach, or, in other words, not so watery and digestible.

September 10.—Our field of shearers was this week augmented by four fresh bands, or 48 additional shearers, who were put under the direction of one of my veterans, often employed in former times when extra hands were brought to the field; so we now cut down a great breadth daily, though the like care and attention are bestowed as at the outset. To save time and avoid confusion, each grieve or steward cuts out and enters the four bands or twelve ridges entrusted to him; and I am now so well acquainted with my troops, that I can place all of them in their proper station, without the smallest difficulty. As we pay weekly such of our hands as leave us on Saturday, a slight drilling becomes necessary on the Monday morning. We go on very smoothly, and keep regular hours. Elliot rings the bell half an hour before sun-rise to prepare; and again, at the first peep of the luminary, when all must march without further ceremony. We have had a few wet, or rather dewy mornings; but, as it was dry above head, Mr. Jamieson, at those times, ordered us to proceed with the work, and to leave the sheaves unbound, or in the state technically called *broad-band.* A detachment was always selected in the course of the day, or when the corn was sufficiently dry, for tying up this broad-band corn; and Howard generally attended those so employed, Fairbairn and I taking charge conjunctly in his absence. Mr. Jamieson has been less with us this week than last one, and more with Elliot, who was busily engaged in driving home corn. Three heads of carts, four in each, have driven for several days, and a considerable number of tall, well-built stacks have been put up, while a set of hands has been employed since the first day in covering them, which operation is here executed very neatly in the dam-board or cross-roping way. About five acres of wheat were thrashed last week, so as good fresh straw might be got for covering;—our summer thrashed straw being two much broken by the machine for resisting rain. This new straw was carefully drawn under Elliot's inspection, and makes excellent thatch. The wheat thrashed has been laid thin on the granary floor, and orders given to turn it daily, till it comes into a keepable state. Being constantly in the field, I have had slight opportunity of personally witnessing the building of the stacks, or the management exercised; but I learn, that a man stands on the stack, and forks the sheaves to the builder, till the stack gets tolerably high, when a kind of opening is left for him to stand, and two stack headers, as they are called, become necessary. The stacks, to be sure, are of great height, and require extra help to complete them; otherwise, I am confident Mr. Jamieson, who is perfectly up to every thing of that nature, would not give such assistance.

September 19.—A good deal of rain has fallen this week, which retarded cutting, and stopped carrying altogether. The first object was to keep all the cut corn a-foot, and to complete the covering of what was carried. Respecting these matters, Mr. Jamieson is particularly careful. When the rains ceased, we cut oats of the late varieties, which were all gaited; in other words, the sheaves were set up single, with bands loose around them, and pulled near to the top, attention being paid to draw loose heads from the bottom, so as sprouting might be prevented. The same number of hands have been employed as last week; and, should we be favored with good weather, the cutting process will likely be finished in eight or ten days. Elliot has completed seed-furrowing the fallow break, and is now entered upon the wheat stubbles, though, as the weather seems now settled, he will return to the work of carrying with all despatch. Twenty stacks of wheat, oats and barley, are put up, all of equal size, and better built than any I have hitherto observed.

September 23.—Shearing is now over here, though, as part of the beans are still to tie, and a good deal of barley and oats to be carried, we will be very busy for a week or two. All the wheat is stacked; what was sown in spring after turnips, is inferior in bulk to the autumn and winter fields, and I also thought it lighter upon the hand. The grain however, is good, being well harvested, and will prove of greater value than the barley sown upon the same field; which reminded me of the prediction offered by Elliot at seed-time, as mentioned in a former letter. The barley after beans is excellent, and, according to my views, may be 20 *per cent.* in the extent of measure, above that on the turnip field, though I must acknowledge that the latter is of superior quality, and worth more to the manufacturer.

October 12.—Harvest is now finished with us, the whole crop being safely deposited in the yard. I mentioned, in a former letter, that nine hundred acres of the different kinds of grain were sown upon this farm, the produce whereof, except what was thrashed from the field, is secured or put up in ninety-six large stacks, all of them nearly of equal size, and affording a notable sight to the beholder, if he is an amateur of rural science. The whole are completely covered for the winter, a measure which engages Mr. Jamieson's notice in a particular manner; he alleging, that a slovenly managed stack-yard furnishes sure proof, that every other branch of farm management is carelessly conducted. The first built stacks have all been tied down a second time, and I understand that a repetition of this operation is continued till the stacks are fully compressed, when it becomes unnecessary, unless a breach is made by a storm of wind, which is immediately repaired. The business of a farmer has been often supposed to be one within the reach of every blockhead; but I am more and more convinced, that, to carry it on properly, a wise head is not only required, but also a steady hand in the administration of the several duties which appertain to the occupation.

The fallow field was last week sown which wheat, at the rate of ten pecks per Scotch acre; and the seed was carefully pickled or moistened with urine, exactly in the like way as done with what was sown in the spring. There was not a blacked or smutted head of wheat to be seen of last crop, which almost satisfied me that pickling is a radical cure or preventive for that abominable disorder. I remember one day before harvest,, when some gentlemen from a distant part of the country were on a visit to Mr. Jamieson, that, one of them having expatiated, at considerable length, concerning their district being exposed to smut from a particularity of soil, Mr. Jamieson took him up, and offered to wager five guineas, that a single smutted head would not be got amongst his fields. Done, replies the gentleman; for I never saw a wheat field in my life but what was less or more smutted. The gentleman then proceeded to examine the field with the greatest attention; but, after an examination of several hours, was obliged to declare that the soil of Mr. Jamieson's farm certainly differed from that of every one he had hitherto known, otherwise it could not have escaped that baneful malady. No, says Mr. Jamieson; my soil is the same with other people's; but perhaps greater exertion is bestowed to avoid an evil, which assuredly is too prevalent, and which proceeds entirely from negligence and inattention.

The winter stock of cattle and sheep is now brought home, Howard having been at several markets to procure them. One hundred head of cattle are provided for the straw yards, and these are presently ranging the stubbles. Howard tells me, they will not be put upon straw so long as the weather continues dry, and that a few turnips will be given them after Candlemas, to bring their blood into good order before the grass season arrives. Twenty score of ewes are provided; and this branch of stock is considered by Mr. Jamieson as highly profitable, though he acknowledges that, without cattle, he could not convert his straw into dung. About forty fine oxen, purchased at the summer markets, and grazed since their arrival on the pasture fields, are intended to be fed at the stake on turnips; but, as these matters are altogether in Howard's department, I can only speak of them in a transient manner.

Last evening Mr. Jamieson gave an entertainment to his servants of every description, on account of the finishing of harvest. He was pleased to take the head servants to the parlor, with his own family, which certainly was paying us due attention; but, after supper was over, he desired us to follow him to the large mill barn, where the other servants were feasted; and, taking a glass in his hand, when we arrived there, desiring us to do the same, he addressed the numerous assembled body in the following terms.

"My lads, I drink health and happiness to each of you, and to your several wives and families.—May Providence bless you all—may you be spared for many harvests, and enabled to perform your respective duties, with the fidelity, as *uniformly* displayed in the one, the conclusion of which we are now solemnizing."

In this kind and benevolent manner does this good man constantly behave to those below him, thereby attaching them to his interest more effectually than can be accomplished by the hard or austere master. Such may procure obedience when present; but the moment that his back is turned, the ties of duty are instantly relaxed. The study of human nature is a science followed by few people; but I am convinced that no branch of knowledge ought to be cultivated with more sedulity. Without some degree of perfection in this science, none can act aright in their passage through life, —none can sufficiently discharge the duties which appertain to their respective stations,—and none can enjoy true felicity, or possess real contentment.

Class IV.

Nov. 4.—Since the finishing of harvest work, my squad has been chiefly employed in cleaning out the stack-yard, casting *gaw* furrows through the wheat lands, and turning dunghills, which are to be applied upon the clover stubbles. Some of my hands have also, on different days, been with Fairbairn at the thrashing machine; as, besides seed wheat and horse corn, about four hundred bolls of barley are already thrashed. In a conversation lately with Mr. Jamieson, I was made to understand that the early part of the season was the fittest time for thrashing barley, merchants being then better disposed to make purchases than at an after period. Most of the straw has been stacked in the court or farm-yard, to be taken down occasionally for littering the wintering cattle which were last week brought from the stubbles. They are divided into three lots, each of which occupies a separate yard, and have plenty of fresh oat-straw furnished to them four times a day, it not being thought advantageous to keep a greater number together. Howard, who superintends the cattle and sheep department, tells me, that much of the after success depends upon arranging the different divisions, according to size and temper, and, in particular, upon keeping those that are polled, or without horns, by themselves. A pump-well is in each yard, which is a matter of importance. The forty oxen purchased at the summer markets are now put to the stake, and fed on turnips, three men being appointed to clean and feed them, and to take care of the hundred cattle on straw. Tups were put to the ewes about fourteen days ago, in the proportion of one tup to fifty ewes, and they are now ranging the clover stubbles. They have been rubbed with tobacco liquor and turpentine, so as itch or scab may be prevented.

The wheat seed is nearly over, all being deposited in the ground excepting on that part of the field under potatoes last crop, to which Mr. Jamieson wishes to give an additional furrow. What was sown after beans required a great deal of harrowing before the surface was reduced sufficiently; but as fine weather prevailed at the time, the work was accomplished in a satisfactory manner. Fifty acres of the clover stubble have likewise been seeded with wheat, which will give three hundred acres under that grain next year, viz. one hundred acres after naked fallow, the like quantity after beans, fifty acres after clover, fifteen after potatoes, and thirty-five acres intended to be sown in spring after turnips. The clover stubble got a double time of the harrows, before the seed was distributed; and, being well laid over in the ploughing, little of the turf was drawn up in the harrowing process. Every field is neatly water-furrowed, and the cross and headland furrows completely digged and cleared out, so as water may run off without the smallest interruption. Hitherto the ploughs have gone two journeys per day; but next week Mr. Jamieson proposes to limit their work to one journey of five hours and a half, and to employ the ploughmen at any odd jobs about the homestead, after their horses are foddered and cleaned.

Nov. 30.—The small patch of wheat after potatoes, was finished a few days after the date of my last letter; since which, Elliot has been busy with the ground intended for beans, one half of which he has ploughed across, and the other he is now ploughing in length, intending to give this portion a cross-furrow in spring, preparatory to the drilling process. You will remember that I mentioned this plan in one of my first letters; and Mr. Jamieson is resolved to give it a fair trial. There can be no doubt of success, provided the weather is dry at that season; but that provision must be risked, and indeed such risks are unavoidable in every branch of farm-management, where good weather is a necessary appendage to their successful completion. At all events, as the land is well gathered up, it must be much sooner dry in the beginning of spring, than the field ploughed across the ridges, though the strictest attention was paid to water-furrow the latter in the completest manner.

A very considerable quantity of grain has been delivered to the merchant this month, three fourths of our barley being thrashed, besides several hundred bolls of wheat and oats. Fairbairn's people are seldom out of the mill, being either thrashing or dighting; and as there is plenty of barn-room, two pair of fanners are constantly employed when the latter operation is going forward. Hitherto, the working horses have been fed upon hay since the green food was finished; but now they are to be put upon bean straw, which is to be regularly tied up in bunches, under my direction, as it comes from the thrashing mill. Two feeds of oats, of six pounds avoirdupois each, are given to every horse per day; and, though lately hard wrought, they are in tolerably good condition. Mr. Jamieson, about a fortnight ago, purchased four fresh horses, five or six years of age, to replace the like number that were getting superannuated, and informs me that he is always well satisfied when a greater supply is not annually required. He gave two hundred guineas for these four horses, which will show you the extent of expense required to support the tear and wear of his working stock. Few casualties or diseases have occurred since I came here, with this branch of the stock, and only one concluded fatally. This was with a horse affected with dry gripes, or belly-ache, which ended in mortification, and killed him in twenty-four hours after he was seized.

The turnip cattle are doing well, and regularly looked after. As the field, whence the turnips are brought, is at a considerable distance from the farm-yard, two carts are constantly employed in driving them home, with an additional number on Saturday, so as Sunday's maintenance may be provided; but Mr. Jamieson means immediately to store a considerable quantity in the stack-yard, as a resource, should snow fall, or frosty weather set in; a measure, undoubtedly, of material importance. I consider the expense of carriage home as not short of three pounds sterling per acre, which in one respect might be saved, were the crop consumed by sheep on the spot; but then, how and in what manner would the immense quantity of straw on the premises be converted into dung? Holding this important circumstance in view, the system adopted must be considered as highly beneficial, even though attended with a heavy expense, therefore deserving of imitation. No turnips have as yet been given to the breeding ewes; and I understand they will not receive any till the middle of January, unless a snow storm happens before that time.

Dec. 18.—We were all much alarmed lately by a severe indisposition which attacked our worthy master; but providentially these fears are now removed, by his complete recovery. On the second day of his illness, when a violent fever was dreaded by the medical people, he sent for his five head servants, and calmly stated, that, being unable to give directions, he requested each of us to manage the work of his own department in the best way possible, till the issue of his indisposition was determined; and added, "You all know my general intentions so well, and have acted so faithfully in my service, that I have the firmest trust matters will go on much in the same way as if I were at your head." After signing a draft on his banker in favor of the clerk for one hundred pounds, out of which the working people might be paid during his illness, he shook each of us by the hand when we retired from the room, offering our earnest wishes for his recovery.

That same evening we had a meeting in the clerk's office, when with a view to promote the interest of our employer, it was agreed upon, that Elliot should assume the general control, and that each of us should submit implicitly, *ad interim*, to his directions, in order that regularity might be preserved. Orders were therefore given out in the same way as if they had proceeded from Mr. Jamieson himself; and so powerful is the force of former habits, that prompt obedience was given by every one to the orders issued, though it was well known Mr. Jamieson had no hand in them. I will not say that the like obedience could have been long maintained, as probably the steady discipline exercised by Mr. Jamieson, like the centrifugal force of a machine, carried the system on, even when the impelling power was withdrawn. Be this as it may, I rejoice that Mr. Jamieson's recovery prevented the strength of our government from being ascertained. In four days, his disorder, which originated in a severe cold, took a favorable turn, and, on the eighth day of his confinement, we were admitted to his room. He is gradually getting better, though, hitherto, he has not been out;—a caution justified by the season of the year.

I have often reflected upon the critical situation in which the affairs of a farmer are placed, when he is confined to a sick-room, and cannot help thinking, that his case is then more to be lamented than that of other classes, when deprived of health and strength, and prevented from attending on business. The chance of loss from dishonesty and unfaithfulness in those employed, may be viewed as the same in every instance; but, laying these things aside, the nature of the farmer's affairs or business is such, that the best arranged system cannot be followed out, or carried into execution with the like precision or uniformity, as is perfectly practicable with a business carried on within doors. Hence in the first case, when the main-spring or impelling power is partially impeded, the motion of the small wheels is likewise irregular and disordered. To speak in plainer language, the propriety and expediency of every field operation depending upon the weather, mischief, instead of benefit, is often committed by the most active exertions, when not tempered by judgment. Not many led farms, as they are called, are therefore managed judiciously, except when committed to the charge of a servant qualified for being entrusted with discretionary management; and where such guide, the master's presence is of less importance. The same remark applies to farms possessed by widows, especially if they interfere in the executive department. Unless a very steady and clear-headed overseer is procured, it would, in nine cases out of ten, be more for the interest of those concerned, even for the landlord, that such farms were instantly subset, then to remain under the feeble management and imperfect husbandry generally exercised.

Dec. 30.—Mr. Jamieson is now quite well, and has resumed his superintendence as formerly. I can assure you, that the resumption affords every one of us much happiness, on more accounts than one, because, during his confinement, we felt an anxiety not to be coveted. We have got thanks from him for our attentive management, as he was pleased to characterize it; and what some people would consider as of more value, a guinea a piece to buy a new hat, as a compensation for extra trouble. I have intimated to him your desire that I should return home at Candlemass, which he kindly acquiesced in; and am vain enough to think myself now qualified, either to give you material help, or to take charge of a farm, should such be procured on my own account.

The land intended for turnips and beans, next season, is now all ploughed over, and Elliot is proceeding with what is meant for summer fallow; though, in my sight, this field does not stand greatly in need of that operation. It is better, however, to *keep* clean than make clean; therefore, as the field has run its course, a summer dressing must be highly beneficial. Mr. Jamieson has repeatedly said to me, that in no way whatever can the same benefit be received from manure, as when applied to a summer fallow, because the pores of the earth are then open, and duly prepared for receiving a supply of nourishment; whereas, when laid upon grass or unploughed land, and turned in with a whole furrow, the ground is only partially impregnated by the manure. I think this accords with reason,—therefore felt surprise when I learned, that there is a set of agriculturists who decry summer fallow, as an unnecessary and useless practice.

We have got abour two hundred cart loads of turnips home to the stack-yard, where they are built in a long stack, with an arched roof, and well covered in, for resisting the weather. The tops and tails were all cut away, and given to the wintering stock. I suppose the turnips thus brought home may answer for twenty days food; therefore, as snow storms are rarely of longer duration, little inconvenience can be sustained from hard weather. Besides, we have a large houseful of yam potatoes, which will make up for any after deficiency.

I mentioned before, that the bean straw is tied in bunches by a part of my squad, and lately had the curiosity to ascertain what quantity of ground was required to furnish straw, for one day, to the working stock, and the quantity of grain yielded from the straw of one day's consumption. I first inquired at Fairbairn, about the number of acres on which the contents of each stack were raised; and finding, on an average, that the bean stacks contained the produce of seven acres each, I kept an exact account of the bunches of straw; and the result was, that six hundred bunches, of one stone and a half, of 22 lib. avoirdupois each, were in the stack. Now, as I learned afterwards that the quantity of grain amounted to 63 bolls, of 4 bushels each, which was at the rate of nine bolls, or thirty six bushels per acre, and as the working stock (36 plough horses, and 4 old ones for driving turnips,) require 60 bunches per day, it appears, that a stack will suffice exactly for ten days consumption; that straw is used each day, which carried six bolls, one firlot, and three forpets of grain; that each bunch of straw yielded something less than one peck and three forpets; and that the extent of ground which produced the straw for one day's consumption, was seventy hundredth parts of an acre, Scotch measure. I have detailed these particulars, being sensible, that every thing favoring method and accuracy, is highly acceptable to you.

The machine thrashes the beans most completely;—indeed, not one pod is left unstripped of its contents: but in some cases it *hashes*, of course wastes, the straw considerably. Mr. Jamieson says that the saving from machines is much greater with wheat and beans, than with oats and barley;—the first mentioned grains being rarely clean thrashed before machines were introduced. The reason he assigns is, that unless sharp skutchers are constantly used, oats are seldom completely thrashed; and that barley, by reason of the long awn which adheres to it, is with difficulty prevented from going off amongst the straw. Indeed, he one day assured me, that a machine, to be perfect, should be provided with two sets of skutchers; one for oats,—and the other, more round, for wheat, barley, and beans. He added, that sharp skutchers do not suit wheat, as they cut the stalk over by the neck, and so occasion much of the grain to remain amongst the offal.

Jan. 16.—After two or three days frost, a heavy fall of snow came on last week, which, for a time, has effectually stopped field operations. All Elliot's people, and some of mine, are therefore employed in removing dung from the straw-yard, which is middened on the field intended for turnips, and, with every coat of dung, or, more properly speaking, unrotted straw, another of snow fallows, which in my humble opinion, will have a powerful effect in hastening putrefaction; because, independent of all chemical reasoning on the subject, the snow will only melt in a gradual manner, thereby moistening the dunghill much more effectually than if the greatest quantity of water had been thrown upon it. Mr. Jamieson declares, that he never saw a bad hill of dung, when mixed up with a full quantity of snow; and that this incorporation ought not to be neglected, when the means are gratuitously provided by the elements. I omitted to mention, that the turnip dung is also laid in layers upon the dunghills, and that the whole is carefully shaken and spread thereupon. We have already got out a large quantity, and, should the storm continue, the yards will be cleared. However, as there is an immense pile of straw in the centre yard, from which the places bared of dung are constantly covered, there will, in a little time, be as much accumulated as ever. About one third of the stack-yard is emptied; and, should the storm continue after the farm-yards are cleared, Mr. Jamieson says he means to thrash incessantly till good weather returns.

My squad have partly been employed, for two months past, in cutting hedges, and some of them are remarkably dexterous at that operation. Mr. Jamieson has all his hedges broad at bottom, and narrow at top; and in this way a fence is obtained, infinitely superior to the best stone walls. A very few years care, at the beginning, puts them into a situation for this mode of training; and, if that care is continued till they arrive at maturity, the after expense is perfectly trifling. Many farmers, good in other respects, are careless and indifferent about their fences, and neglect to protect and train up what was originally planted at a considerable charge. Without entering upon the general question, viz. the necessity of fences in every case, all I would say, is, that where they have been reared, a suitable attention ought to be bestowed upon them afterwards. Where a hedge is planted, it must be taaken for granted that it was deemed necessary; therefore, neglecting it afterwards must be considered as unpardonable conduct.

The ewes have got turnips since the storm commenced, a part of the field being railed off; to which they are taken through the day, but at night they are removed to an adjoining park, purposely hained and kept rough for such an emergency. Here, by scraping, they contrive to get a tasting of food; and as they have a bellyful of turnips every twenty-four hours, their situation is tolerably good. One day we had to shovel the snow from the turnips, before the poor animals could get at them.—Only three, out of twenty score, have died since they came to the farm, in October last. Mr. Jamieson says, he has often suffered at the rate of five *per cent.* through the season.

Jan. 30.—I am now preparing to depart from a place where I have enjoyed much happiness, and, seen a great deal of business; having little more to do, but to get the inventory of implements taken off my hands, and the several accounts due to the men under my charge examined and audited. These things, I confess, are absolutely necessary; —still they do not afford me satisfaction, because they remind me that I am to leave the service of a gentleman who has uniformly behaved to me like a father, and that I am, more to associate with fellow servants, from whem I received uncommon instances of friendship and favor. Duty to you, however, is a permanent principle in my breast; and though feelings cannot be overcome all at once, yet still those, which impress me at the moment, will not, I hope, in the slightest degree prevent me from enjoying the like happiness at your fireside, as I have experienced in this hospitable mansion.

The day before yesterday Mr. Jamieson sent for me from the field, and I waited upon him immediately. "George," says he, " I am more at leisure just now than I probably may be at your departure; therefore cannot employ myself better than in giving you a few advices, which, likely, may be useful when you settle in the world, or in your passage through it afterwards. In the *first* place, let me assure you, that I am well pleased with your behavior when in my service, because it has been steady, regular, and inoffensive; but on these points I mean to write my good old friend, your father, which will be more satisfactory to him than any thing communicated through your medium. In the *second* place, I recommend most earnestly, that you would take particular care of your conduct and behavior when entering into active life, because I have known many young men get a character stamped upon them at that time, which no future alteration of conduct was capable of removing. Be consistent and steady therefore in your actions,—cautious in forming schemes and connexions,—but firm and determined in the execution. Think for yourself at all times; and, though it is often wise and prudent to refrain from communicating our thoughts to others, yet, at no time, act contrary to the dictates of your own mind, or resign self-government in favor of another, whose interest, and whose views, may have a contrary direction. A man who is sober, attentive, and of any strength of mind, will rarely go far wrong; at least, if he does, he will soon be recalled to duty, by the influence of conscience, that vicegerent of the deity; whereas the person, who is irregular in his conduct, and without principles to govern his mind, may be compared to a ship in a boisterous sea, unprovided with a helm: He is tossed to and fro for a few passing years, and finally wrecked upon the shoals of misery and ruin.

"In the *third* place, as a large share of every master's happiness, even of his professional character, depends upon the integrity and faithfulness of those below him, I cannot sufficiently recommend to your notice what may be called the economy of managing servants; because, by studying this art successfully, your own interest may not only be promoted, but also the welfare and comfort of the laborers in your service materially increased. Servants with all their imperfections, (and God knows no human being is altogether perfect) are rarely so bad as represented; and in many instances their defective conduct may be imputed, in some measure, to the master himself, in so far as he neglects to teach them their duty, or behaves to them with roughness or asperity. When you, George, become a master, treat your servants with kindness; and I venture to say, that, almost in every instance, a suitable return will be experienced. The best servant may fall into error at a time; but when one of this character happens to make an unintentional mistake, rather wink at the fault, than reprehend it in the manner too customary with many people. Depend upon it, more good may be done in this way, than by adopting a contrary conduct; that is, if the servant is gifted with the slightest portion of sense and discernment. The thoughtless and profligate, I would not retain on any consideration; for it is an old and a true saying, that one scabbed sheep is capable of infecting a whole flock.

"*Lastly*, I advise most strenuously, that regular and correct accounts be kept of your whole proceedings. This system of correctness I do not restrict to the mere articles of debtor and creditor,—a length to which every man goes who pays the slightest attention to the management of business; but extend it to disbursements of every kind,—to the produce and sales of your crop,—to the returns and profits of stock,—and to an yearly balance of your affairs. The pleasure and satisfaction arising from these expositions, independent of their manifest utility, will afford a full compensation for the trouble thereby given: and were I to add, that a daily journal of your transactions would also be advantageous, it would only be inculcating the utility of a practice constantly carried on at this place, since I entered upon farm management.

"Let me see you often here; and rest satisfied of receiving my best advice at all times. If disposed to write me, be assured that a speedy answer shall not be neglected. I wish you well, and trust the lessons received here, will be of advantage to you afterwards."

The foregoing contains the substance of Mr. Jamieson's advices to me, which I hope have made an impression upon my mind, never to be obliterated. My correspondence from Barn-hill shall now cease, as I expect to be with you in eight or ten days from this date; and to detail, more particularly than practicable upon paper, the many proofs of friendship displayed by Mr. Jamieson during the twelve months I have been under his protection. I am, your dutiful son, &c.

BADEN CORN AND OKRA COTTON.

To the Editor of the Farmers' Register.

Poplar Springs, Fairfield, S. C.
September 25th, 1839.

Having read and heard a great deal about the Baden corn, I obtained some of it last spring and planted it, expecting to make a tremendous crop. but, to my utter astonishment, it is the poorest corn that I haye seen grow on my plantation. I planted some of it on high land, and some on good creek bottom, and neither made so good a turn-out as my own corn that I have planted for several years, the seed of which I obtained from York district, in this state.

Notwithstanding the experiment which I have made has entirely failed in turning out as well as I was induced to expect, I am not altogether disposed to discredit the statements of those who have done so much with it at the north. At the north, they plant their corn about three feet each way, and leave three or four stalks in each hill, and this is the way they make so much to the acre. Here we have to plant our corn four feet each way and leave one stalk to the hill, or five feet each way and leave two stalks to the hill. The climate here will not allow it to be planted thicker. The fact is, that planting corn too thick is a fault too common among our planters.

The method of planting and cultivating at the north will not answer in a southern climate, with respect to corn particularly. I have planted corn four feet each way and left one stalk to the hill, and I have found this to answer best on high land; and five feet each way and two stalks to the hill, the best on bottom land. Some planters, however, prefer planting in the drill, with the rows five or six feet distant, and leaving the stalks from 18 inches, to 2 and 3 feet apart in the drill, according to the quality of the land. Judging, from my experience and observation, the best seed corn for a southern climate, is to be obtained from the upper parts of the Carolinas and Virginia; and I consider it advantageous to get seed corn from there every few years.

Our lands in the middle part of this state are wearing out so fast, that unless we adopt some system of improving the soil, or substitute some other crop in the place of cotton, many of us will have to desert the country and look out for better lands in the far west. I think it would be well for our planters to employ a part of their hands in the silk business, and raise more grain and stock; they would then have more time to improve their lands by a system of manuring. We are to have an agricultural convention at Columbia in November, which it is hoped will do something to improve the agriculture of the state.

Last winter I obtained two quarts of okra or win cotton seed, in Mobile; the two quarts contained about 7000 seed. I planted them, and not more than about 400 came up. I cannot give a decisive opinion yet with regard to this cotton; my present impression however is, that it is not much better than the Baden corn. I received a handful of cotton seed last spring from a friend, of Barnwell district of this state, which I think he told me was called the twin cotton there. It is not the okra or twin cotton, but I think it is the Petit Gulf improved; and I like it better than any cotton I have seen this season. I planted all the seed I got, and they came up very well; it is now he best bowled cotton I have. I shall call it Barnwell cotton.

Yours, &c.

JOHN J. MYERS.

SUPERIOR ADVANTAGES OF THE OLD SOUTHERN STATES FOR SILK-CULTURE.

To the Editor of the Farmers' Register.

Indian Key, T. F. Aug. 7th, 1839.

By your editorial remarks on page 355, I am sorry to see that you seem to consider me an *opponent* to the culture of silk in the United States; and that, therefore, my views ought to be welcome o all among your readers who may disbelieve in he fitness of our country for silk-culture. You will hence permit me to declare that I do heartily believe in the great fitness of our country for *bona fide* silk culture; that I do earnestly believe in the greatly superior fitness of that section of our country embraced in the old southern states; but that I also do most solemnly believe in the immensely greater superiority of Southern Florida both for he growth of the mulberry and the production of silk. During my continuance in office at Campeche I wrote very little on the subject, either *to* the United States or *for* the United States, because I saw that the topic was employing the pens and purses of many abler and richer writers. The only passage in my official letters relating to the morus multicaulis, I believe is contained in my communication to the secretary of state, dated the 23rd November, 1834;* and the facts and opinions thus and then incidentally introduced, I still conscientiously and firmly sustain. Since my return to my native country, I have joyfully observed the progress of the propagation of the Manilla mulberry throughout the *old southern states*, because I believe that the *bona fide* production of raw silk in those states will be more beneficial to them, and to the nation in general, than the same amount of raw material produced in all the other existing states of the union! But this belief is *not* founded on the *false hypothesis* that this new branch of rural industry will yield *greater profits* than an equal amount of labor and capital employed in the culture of corn or of cotton. Yet this belief *is* based on the *undisputed facts* that this new industry will occupy the poorest soils and the feeblest persons, which and who cannot be profitably dedicated to the culture of any old staple of agriculture; and that raw silk can hence be raised at a cheaper price in the old southern states, than it can be produced in the old northern states, in the new western states, or even in the new southwestern states!! In comparing the whole United States with the whole of Europe, or the old southern states with the south of Europe, the only *indisputable* superiority which *we certainly* possess, for competition in the production of raw silk, consists in the much greater cheapness of our poorest soils, and consequently in the *much greater cheapness* of their produce in food for silk-worms!†

Now in comparing the *old* southern states with all the other states, it will be easily seen that you have and will retain this great indispensable desideratum of durable superiority in the primary element of *cheapness* of the raw material—of the mulberry leaves. But in the secondary element, the *cheapness* and the *command* of laborers, you have the same great relative superiority over all the other states, in the conversion of this *cheap* food into *cheap* cocoons! and consequently into *cheap* reeled silk! Now, sir, you admit that $4 a year, per acre, of clear profit, if derived from all the "poorest soils" in the old southern states "would be an immensely profitable change from the present state of things, both to the individual proprietors, and to public interests." And what was the object of the *counter estimates* of my communication, except to show that at the *low valuation* of 25 cts. per 100 lbs. of mulberry leaves, your *poorest* soils with *common* culture may *commonly* yield the value of 12½ dollars per acre? But, sir, for the sake of the southern states themselves, I should prefer a much lower valuation of the leaves; and I hope that you yourself will soon demonstrate that you can make $4 net profit per acre per annum by selling, on the trees, their leaves at 12½ cents per 100 lbs! *i. e.* 3200 lbs. of leaves from an acre of the poorest soil. I need not argue with you that New England, or any northern state, cannot afford to raise and sell the leaves of the Manilla mulberry at even 25 cents per 100 lb. Neither need I enter into details of the impolicy of the new western states to attempt to produce these leaves at that price, on even their richest soils. The new south-western states have an equality in climate with the old southern states it is true, but while they have an excess of the most productive soils for sugar and cotton, and a deficiency and dearness of laborers to cultivate them, they will not surely be tempted to divert any portion of their capital and labor to the production of mulberry leaves at 25 cents per 100 lbs. Yet even at this low valuation, their production will be profitable, politic, and highly desirable in a national view. In all the new states the public sales of governmental lands have thrown into private hands much more rich soil than can be cultivated in twenty years! From the commencement of the system in 1787, to 1834 inclusive, or in 48 years, the whole amounted to upwards of thirty-seven millions of acres; while from 1835, to 30th June 1837, or in 2½ years, the sales amounted also to upwards of thirty-seven millions of acres!! Until these are settled, it will be unprofitable and inexpedient for the new states, either western or south-western, to engage in the rival production of silk with the *old* southern states.

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* "But there is another plant and product of the East Indies which can be much more profitably propagated in our tropical territory than even in our warmest extra-tropical districts, that our coldest states are actually sinning against the now established policy of he nation, and against the future prosperity of their own citizens, in continuing their war against nature, to force the domestication of the many-stemmed mulberry tree of Manilla, and of the tender silk-worm of southern China, although not more than one crop of cocoons will be the average annual reward of their mistaken labors.

"In Guadaloupe the French government sustains an establishment of 40,000 plants of the morus multicaulis, and from experiments made in that island during three successive years by Dr. Meunier of the Royal Navy, and repeated in Cuba by Professor Sagra of the Royal Botanical Garden and Pattern Plantation, near Havanna, it is demonstrated that ten successive crops of cocoons every year may be obtained from the perpetually unfolding leaves of this valuable exotic in tropical climates, and consequently in Tropical Florida. Let, then, New England send to this productive climate only one-tenth of her surplus population now unprofitably employed in the production of cocoons, and she will thus insure to the other nine-tenths, in their wintry home, a much more profitable employment in the manufacture of silk alone."

† There is yet another ground of superiority of the United States in general, and of the southern states in particular, over Europe, still greater than the cheapness of our lands. This is the dryness of our climate; a requisite for silk culture which cannot be as well supplied in Europe, by all that art and science have effected.—ED. F. R.

Under our free trade confederation, every staple of agriculture will be produced the most in those states where it can be most cheaply raised. The cotton-growing districts have hence been constantly travelling further south and west; and hence the silk-growing districts will finally be clustered in the old southern states. But let the southern planters "first be sure they are right, and then go ahead." Let them *not* propagate the Manilla mulberry on any soil which will yield them in other staples *more* than $4 net profit per acre per annum; and let them be content with selling the leaves at 12½ cents per 100 lb., if at that rate the morus multicaulis will yield them a net profit of $4 per annum for every acre of their poorest soils. Let both the propagator of the plant and the feeders of the worm consider the silk culture to be only a *collateral branch* of farming, like the rearing of poultry. Let them consider it only as a means of employing poor lands, and feeble hands, which would be otherwise idle and unproductive; and they may then challenge the world to rival them in the production of raw silk!! Let them also consider its importance as a means of attracting an emigrant population of small cultivators to occupy their hitherto worthless soils, and the mere value of the silk itself will shrink into comparative insignificance when taken into the estimate of the vast additions which will thus be made to their power, prosperity and tranquillity, in a thousand channels.

After all the noise which has been raised by speculators, the reflecting statesman may be surprised at the very small surface of ground, and the comparatively small number of laborers, which, with only one crop of cocoons per year, are really requisite to supply the United States—Europe—the whole world—with raw silk!! Take "the certainly not too high" estimate of the national silk convention of Baltimore; *i. e.* 51 lbs. raw silk per acre! One hundred thousand acres would then yield 5,100,000 lbs. raw silk, a quantity sufficient to supply (at the very least) *twice* the average annual consumption of the United States of manufactured silk in all its forms!! Yet 100,000 acres would be scarcely missed, if struck off the map, or separated from the jurisdiction, of old Virginia!

To raise that silk the highest estimates would employ only 500,000 feeble persons only six weeks in each year, equivalent to the steady employment of only 60,000 persons a year; that is, if we allow four days' labor to be requisite to produce a pound of reeled silk. Yet, if I have understood the calculations of G. B. Smith, esq. the highest authority in the United States, he does not make the average labor to exceed two days to each pound of silk; and at that rate the number of laborers for six weeks would be reduced to less than 250,000 persons! But take my estimate of 25 lbs. reeled silk per acre, and then 5,000,000 lbs. reeled silk will require but 200,000 acres of the poorest soils of the southern states, or about the half of *one per cent* of the superficies of Virginia! How does this agree with the assumption of Judge Comstock, that 35,000,000 of morus multicaulis will not suffice to supply the little state of Connecticut! when tested by the doctrine of G. B. Smith, that for a permanent plantation to make silk there should be only 2420 trees upon an acre? But as the latter signed the estimate of the convention of 51 lbs. reeled silk per acre, *less* than 25,000,000 of morus multicaulis would suffice to plant the 100,000 acres requisite to produce the 5,100,000 lbs. of raw silk. Hence let the speculators' cry of deficiency in this year's planting be ever so loud, I am satisfied that by the 1st of November there will be a *greater number* of buds of the morus multicaulis in the United States than will be requisite in the year 1840 to grow all the leaves necessary to make 5,000,000 lbs. of raw silk; and I *hence congratulate* the old southern states on the fact that the *epoch has arrived* for the *bona fide culture of silk*. Now, sir, although you believe my "estimates" of profits and products to be generally too low" let us see whether they do not present sufficient encouragement to the extension of silk culture throughout the old southern states. Although you believe that I have allowed *too much* (5000 pounds of leaves) as the product to be expected from the "*poorest soils*," yet your belief that I have allowed *too little* in all the steps of their conversion into silk, induce me to believe that you do not consider too high my final estimate of 25 lbs. of raw silk per acre. In either way, the *proportionate value* of the leaves, *on the trees*, will be one-sixth, or at the cocoonery one-third, of the price of the reeled silk; and hence with reeled silk, at $3 per pound, the *leaves on the trees* (be they more or less) will always be worth $12 50 cents; "and every cultivator in Virginia knows that *this is a much better profit* than is obtained, not only from the poorest soils, but from those much better than the poorest soils; perhaps from half of all the land now cultivated in grain." The *very great encouragement* that I then offer to the southern states may be summed up in the *simple facts* that with the *lowest estimate* of 25 lbs. of silk per acre, at the *lowest price* of $3 per lb., or $75 per acre, I deduce the *fact* that the *value of the leaves on the trees* will amount to $12 50 cents per acre per annum on the "*poorest soils*." The *same lowest estimates* also afford the *highest rational encouragement* to the conversion of those leaves into silk by the feeblest and otherwise least productive laborers. Deduct 50 cents for the cost of the *leaves* on the trees, and $3 50 cents remain to compensate the laborer for tranporting them to the cocoonery, for feeding them to the silk-worms, and for reeling the silk from the cocoons, requisite to yield one pound of raw silk, worth three dollars per pound. But to do all this labor, the highest estimate of the *time* requisite to perform it we have seen is but *four* days for a single person, for which he will receive at the rate of 62½ cents a day. And is not the gain of 62½ cents per day sufficient encouragement to induce the southern states to employ in the silk-culture all their feeble hands which would be otherwise idle and unproductive? To sum up the whole, in a few words, I insure to the old southern states the sum of 12½ dollars per acre for their poorest lands, and 62½ cents per day for their feeblest hands, when employed in the *bona fide* production of reeled silk at $3 per pound. HENRY PERRINE.

P. S. I predict that *you* will not continue to raise cocoons, *for profit*, during three successive years, when you can sell *all the leaves on your trees* at 25 cents the 100 lbs. or $12 50 cents per acre of the poorest soil. H. P.

CAUSES OF BAD SILK-WORMS' EGGS.

From the Silk Culturist.

The great demand for silk-worm eggs, and the extravagant prices they have commanded the past season, have induced many persons to lay in large stocks for the supply of the demand, which is reasonably expected to be greater another year. It is desirable that an ample quantity be preserved, in order that all may be able to procure them at fair prices; but it is more important that they be of a quality that will not disappoint the expectations of the feeder. Nothing is more discouraging to the beginner in silk culture, than a family of diseased and dying silk-worms—and such he may rest assured will be his experience, unless he takes especial care to furnish himself with good eggs. Eggs, to be good, must be laid by large and healthy moths, and be carefully kept through the winter. There is no difficulty in saving good eggs, if the proper method is pursued; but if not, they will be of an inferior quality, if not entirely worthless.

Judging from present appearances, there will be large quantities of eggs thrown into the market, the coming fall and spring, most of which will be of little or no value. We hear of individuals industriously engaged in hunting up cocoons for the purpose of increasing their stock of eggs. It is said they purchase small lots here and there, and mix them up together without regard to quality, or variety—make no selection from the largest and firmest cocoons from the common mass, but suffer the moths to eat out of all, and lay their eggs. One individual, we are told, has procured twenty bushels, or more, of cocoons for this kind of management. He will doubtless have a large quantity of eggs, and may fill his pockets to overflowing; but it will be at the expense of honest, but credulous, purchasers. The injurious effects also, which such speculations have upon the silk enterprise in this country, cannot be estimated by dollars and cents. The man who sells shad's eggs, white mustard seed, &c. for silk-worm eggs, undoubtedly injures the cause of silk culture; but in a far less degree than the man who palms off upon an unsuspecting novice, the genuine article, but of a quality, and in a condition, which renders it worthless. If beginners would succeed, they must exercise a great degree of care and caution about these apparently small matters—for upon them, their success or failure principally depends. It is believed there will be good eggs enough in market, to supply the wants of all, and we would advise all to obtain their supplies of regular and responsible dealers, in preference to hawkers, whatever may be their pretensions.

PROMISCUOUS REMARKS.

For the Farmers' Register.

Industry and economy.—Industry is of first importance, economy is second. Without industry, nothing is obtained, without economy nothing is retained. But when we speak of industry and economy, we wish to be understood as connecting therewith discretion and judgment; for industry improperly applied is worse than idleness; and parsimony is not economy.

The dwelling, the out-houses, the fences, and ditches, are all made by industry; but economy requires that they be located with discretion and judgment. The old stock of Virginians are fond of placing their dwellings on the hills; I, being one of this stock, reside on a hill, but if I may ever build again, I shall certainly locate so that I may obtain spring water at hand. My people, my horses, my cows, my poultry, could then drink pure water at will, without the trouble and expense of travelling after it, and all the otherwise worthless slops from the house, the kitchen, and privy, could be moved off by the superabundant water, and dispersed on an adjacent meadow. One hundred yards would be sufficient distance between the dwelling and stable and cattle yard; the space between should be my garden; the water should first pass my yard, then to the horses, then the cows, then on the meadow. From the kitchen I would have a second course of bored logs directly to the meadow, for the purpose of conveying, as required, the above-mentioned slops and excrements with the water, so the water for the beasts should not be damaged. Indeed, to come short at it, I have the stables, cattle yards, meadow, and water, now standing and in operation to suit my mind; all I lack is the dwelling and garden properly located.

I draw and use the water first, then in succession my horses, cows and meadow. My cattle yards are oblong squares; they are not made basin-like, as recommended by all the books, but the upper end and sides being highest, the superabundant water (either rain or stale urine) passes off, commingles with the spring water at the lower end and exterior of the yard, and is dissipated where required on the meadow.

The spring from which the above mentioned water is drawn, not yielding a sufficiency for the meadow, it is my intention shortly to draw from another and more abundant source, which will not commingle with that now conducted till they both arrive at the lower end of the cattle yard. Now if my dwelling were located at the above mentioned desirable spot, and this abundance of water once there, there would be no need of the second set of bored logs above mentioned, and my garden and meadow would quickly repay me for the expense of their watering. Muddy water for this purpose would be best, because the mud would be manure, and such I intend to use; moreover I have a saw mill at the intended point for entering the water into logs, into which logs I can at pleasure cast the saw dust to be conveyed to, or into the cattle yard, and there prepared for manuring, by mixing it with dung. By building a reservoir with a few feet head, a large quantity of water, with saw dust or other like matter could be conveyed. By using saw dust in its natural state, it is for the first year injurious to a crop, but prepared as above mentioned, it is forthwith an excellent manure.

Fencing is a most tedious, laborious, and costly appendage to a farm, and our law which compels the farmer to fence up his crop, or in other words, to stand guard around his field, is in a civil country of all things the most uncivil. In ancient days the greater portion of the lands belonged to the king, and afterwards to the commonwealth, consequently these were a common; but now the lands are owned by individuals, and no individual should be compelled to stand guard over his property. It is my business to keep my beasts on my own premises, otherwise by the law they are estrays; yet strange it is, although estrays, and consequently depredators in the wild woods, yet if they find a field not protected, they are at liberty to eat and destroy, and their owner is clear of damage. Suppose the law were so amended as to make it the duty of every owner to keep his cattle from going at large, then our arable lands might be safe without fencing, and much cost and vexation be avoided.

In ancient time, horses were turned into the woods to find a subsistence. This has been abandoned, and to the observant eye it is also now required that cows and hogs be also enclosed; for except in a few wilderness places, there is no longer a sufficiency for their subsistence in the woods. May I not here add, that the time will shortly arrive when it will be found most economical to soil all manner of cattle; in which event, the woods which are now reserved for the building and renewing of fences, would be appropriated to grass, for the support of cattle through the year.

I reside in a country of timber and saw mills, consequently I consider post and plank fencing the most economical. Where lands are cleared of timber, and such timber not otherwise valuable, it should be used for a fence; but where stone sufficient for fencing can universally be had, no valuable land should be reserved, merely for fencing.

The farmer should consider, examine, and determine, where his fencing should be located, and where any permanent location is determined on, the fencing should be made in the most economical manner. If stone be used, the fence should be sunk below the surface of the earth, so that it may stand firmly; if wood be used, the fence should be elevated by cutting two ditches, casting the earth therefrom in the space between, and planting the fence thereon.

A circular piece of ground can be enclosed with less fencing than any other shape; a square with equal sides next cheapest, an oblong square next; corners running outward are bad enough, corners running in are miserable, and detached fields are wretched.

I will close with a few remarks on ditching. When I removed to the premises on which I at present reside, I had about $600 worth of ditching done, nearly all of which experience has taught me was useless work. It is true I drained my bottoms by those ditches, but subsequently I have cleared the banks of the creek running through the bottoms, and at intervals removed obstructions of wood and stone, by which means, in conjunction with the current, the bed of the stream has lowered, so that my ditches are dry, and consequently not only useless, but a nuisance. Where the water strikes the banks abruptly, stones are used as a protection, so likewise are stone walls used as a protection against freshets; but since there is no obstruction in and about the stream, and the bed has sunk, there is but little use in such walls.

In the general, ditches are not cut deep enough, even for meadows. Where a ditch is actually wanting, it should not be less than three feet deep, and often five or six feet would be proper. It is a common remark, "My high grounds are *healthy*, but my low grounds are diseased;" now what is the difference between high grounds, and low grounds, excepting the one is dry, and the other boggy? By deep ditches, your bottoms become dry and healthy, and then there is no more complaint.

MOUNTAINEER.

September, 1839.

POTATOES.

From the Genesee Farmer.

The potato is unquestionably the most valuable root cultivated by man. It is grown with little care, yields good crops, can be grown in almost every variety of soil, and its nutritive properties are not exceeded by any other root either for man or beast. Though it can be cultivated with little care, and though almost any soil will produce potatoes, there are few crops that in both quantity and quality better repay any extra attention they may receive than this root.

The potato, like most other cultivated plants, delights in a strong rich loam, and other circumstances being equal, such a soil will usually produce one-fourth more than one very tenacious and heavy, or very light and sandy. In new settled districts large crops of potatoes are grown in the soils that contain great supplies of vegetable mould; but experience would seem to justify the opinion that in such soils the quality of the potato is rarely first rate. A grass ley—clover is the best—has been found, when properly prepared and manured, to be excellent for this crop; and if the soil is rather moist than otherwise, it is considered as increasing the chances of a good yield. Countries that have naturally a cool moist atmosphere are found to produce far better potatoes than those that have a dry and high temperature. Thus Ireland, surrounded as it is by the ocean, and necessarily of a moist and equable climate, is famous for its potatoes; and of this continent, the part most famed for the quality of this root is New Brunswick and Nova Scotia, which districts are noted for the moisture of climate. With any part of the northern or middle states, however, the fault of not having good potatoes, or not having them in sufficient quantity, must be traced to the negligence of the farmer, rather than any deficiencies of soil or climate.

The preparation of a field for the potato is simple. If a grass ley sufficiently rich without manuring, a rare case with this crop, the sod may be carefully turned over, rolled down, and then the surface earth loosened with a fine harrow, in in which the tubers or sets are to be planted. If it requires manuring, let the manure, and this should be long rather than short, be evenly spread over the ground; with the plough make the furrow, and into this let one hand haul the manure so placed in the furrow. This row is covered by the plough and the operation is repeated till all are planted. Corn on the ley is general preferred, and roots well manured after the corn. The first in the rotation may depend on convenience, as the turf is excellent for either.

A multitude of experiments have been made and recorded, both in England and the United States, to determine the best method of planting the seed, whether in whole tubers, or in roots cut in two or more pieces, called sets. The result of these experiments have been somewhat contradictory, yet they seem to have established the fact that whole tubers will produce rather more potatoes than sets, but not more than sufficient to balance the extra quantity of seed required where whole potatoes are used. There are many farmers who prefer sets altogether, and the probability is, that twenty bushels of large potatoes, cut into sets and planted with a proper number in a hill, would produce more potatoes than the same quantity planted whole; but the space planted would of course be more extensive with the first than the last. Mr. Rhoades of Skaneatles, an observing and very intelligent farmer, says he would not use whole potatoes, could he have them given him, for seed; and his success with sets would seem to justify the preference.

It was once the fashion among farmers to make little mountains of their potato hills; but that seems to have been useless labor, and extra hilling is dispensed with. The ground after planting should be kept free from weeds, the earth stirred with the cultivator or the hoe; but after the tubers have begun to form, the plough should not be used, as it frequently cuts so deep as to disturb the young plants, breaking off the little tubers, or causing the formation of new roots, processes decidedly injurious to the crop. The general length of the vines must determine the distance at which the rows are to planted, and this of course varies greatly in the several kinds commonly cultivated. If potatoes are planted in the rows nearer one way than the other, the rows should run north and south, that the sun may produce its proper effect on the leaves of the plant, and on the surface of the earth between the rows; and the same remark will hold good of corn or other plants, the rows of which should always run north and south, when the make of the land will permit.

When it is found that potatoes yield large quantities of balls, it is considered by many farmers a proof that the potato has reached its maturity and begun to degenerate; the production of seeds in all plants being indicative of this fact. Mr. Knight, the celebrated writer and gardener, maintained the certainty of the arrival at maturity and consequent degeneration of all varieties of plants, the potato among the rest, and the necessity of occasionally renewing them from the seeds, which is the process nature itself employs for preventing the degeneracy or extinction of plants.

There are few districts in our country where favorite varieties of the potato are not cultivated, and not unfrequently the same kind is known in different places by different names. The Pinkeye, the Sardinia, the Mercer or Chenangoa, the English and Irish whites, and the several varieties of the red and black potato, are the best known. The Rohan potato, lately introduced into this country from France, promises to be a great acquisition both for productiveness and quality. But we have yet seen no potato, that, for the table, could be compared for excellence with the Pinkeye. It cannot be considered a great bearer, though it yields well; but for flavor, and amount of nutrition, we think it unrivalled.

The production of early potatoes for the markets of our cities and villages, is becoming yearly a matter of more interest to the farmer; by practising the mode adopted in England of selecting the earliest kinds, and then treating them in the following manner, described by Loudon, important improvements might doubtless be effected. 'The cultivators in Lancashire have found that there is a fortnight's difference between the ripening of potatoes grown from opposite ends of the same potato; that part to which the root is attached being the latest in ripening, while those that spring from the nose end, are found much in advance of the others in vigor, early maturity, and in size.' Each potato is therefore by the gardeners divided into three parts, which are planted by themselves, and thus they ripen and are fit for the market together.

The potato being in its native state a poisonous plant, like many others of the tropical climates, from which wholesome nutriment may be derived, it should not be cooked until ripe, or becomes mealy. The value of a potato depends in a great measure on the starch it contains, and of course the nutritive matter greatly varies in the several varieties, and in the same varieties at different times. Perhaps there is no method that developes the quality of a potato more fully than baking. We have seen a very fine early variety, and also some superior specimens of the Pinkeye, when exposed to the heat of the oven, expand and burst like parched corn into a thousand fragments. Such roots contain little else than pure starch; and the experiments of Raspail on the nutritive action of the potato, shows that in such plants it is found in the most abundant quantity. Next to baking, steaming is the preferable method of preparing this root, and experience shows that it should never be given to any animal unless in a cooked state, if we would derive from it its full value.

Cellars in which the temperature is but a few degrees above the freezing point, or from 40 deg. to 45 deg., are the best for roots, and particularly for the potato; but they keep no where so well as in pits, covered with just enough earth to keep out the frost. Light, and exposure to the air, are injurious to roots, and in pits these are excluded. To have these roots then in their excellence in the spring, enough should be pitted for use as well as for planting. Some writers in the 'Quarterly Journal of Agriculture,' have strenuously recommended that potatoes intended for seed, should be gathered before they are fully ripened, as being less subject to failure, or to disease. But we have never known in this country any thing to justify such a course, and besides, it is, we think, contrary to the course pointed out by nature herself. The average crop of potatoes per acre in the states is not large, owing to the imperfect and careless method of culture. In Susquehannah county, Pa. in 1838, the average of 2,400 acres, was 170 bushels per acre, which we presume exceeded the average of many other sections of our country. Now, in ordinary seasons, and with decent culture, the average should not be less than 300 bushels per acre; and when we remember that many instances have occurred of from 500 to 1000 bushels per acre, such an average could not be deemed extravagant. More manure and less land, would doubtless increase our potato crops, as well as most others.

BREEDING SWINE.

From the Franklin Farmer.

Buffalo, N. Y. August 31st, 1839.

Sir.—Agreeable to the intimations in my last, I now come to the rules adopted by the most successful breeders of Berkshires in this vicinity. Your readers will excuse my particularity in stating them for the reason that the article of pork, as before asserted, is the most important item of western agricultural production, and that I am writing to those who are not *above* their business, but who take the same pride and pleasure in raising a fine race of hogs, as they would in that of blooded horses or Durham cattle.

A boar should never be permitted to be used till seven months old at least, and it would be much better that he were allowed to run till nine months. But if commencing at seven months, he should cover sparingly, say not more than fifteen or twenty sows till a year old, and these as distant apart as possible--one or two only in a single week. From this time till he has attained pretty full vigor, which should take place at about eighteen months age, he may be used a little more freely. His spring seasons might then vary from twenty-five to thirty sows, and his fall nearly double this number. In the meanwhile he should be kept with care. A strong door may open from his pen into another, to which the sow is introduced, the boar is then let in and allowed one coitus only, immediately after which he must be turned back, and the sow taken away. It has generally been noted that one covering produces a greater number and stronger offspring than two or three, and that an *ad libitum* service, is likely pernicious to all parties.

The best food for the boar during the season, is boiled or soaked corn, with plenty of pure fresh water, and for a variety, some swill from the house with meal in it (oat is the best) and a raw or boiled vegtable root or two, and as an antidote of disease and to give tone to the appetite, and assist digestion, a table spoonful or so of sulphur is occasionlly put in his food. Salt is also placed where he can get at it when he pleases, and charcoal or small chunks of rotten wood, together with a handful of crushed bones, if convenient, is thrown. He must be kept up alone in his stye under close cover with a plank floor and plenty of dry litter, the sleeping apartment communicating with a good yard to exercise and root and wallow in, and a strong post placed upright near the centre for him to rub against.

During the interim between the spring and fall seasons, it would be greatly conducive to the health, vigor and longevity of the boar, if he could have a run in a cool grass pasture, with clear sweet water passing through it, and take lighter food than when in service, but yet sufficiently nutritious to keep him in fair store order. A good animal thus treated, may last ten to twelve years, and get excellent stock from first to last. But great care must be taken that he be not *over-worked;* this is deemed very essential. It is the great fault of us Americans, that when we have obtained a male that has any way distinguished itself, instead of husbanding its resources, we use it too much, and this is one great reason why the stock of such animal so often disappoints the public. I understand that particular English breeders limit their best horses and bulls to about thirty females, and often as low as twenty or five and twenty. What their usage is for boars I do not know, but suspect that it would be less than here allowed. *It will be* admitted however, that individual males may serve well a greater number than limited above, but my principle is, not to work them up to their full capacity; if error must be committed, it is better that it be on the safe side.

Unless a sow were very coarse, and the object was to fine her, I would not allow her to breed at eighteen months old; and if something extra was desired, she ought not to come in under two years, there is then no check in growth, and the first litter is usually as good as any subsequent one. She ought to be taken up and occupy a place alone, either in a pasture or a pen similar to that described for the boar, one month previous to farrowing, her condition kept good and strictly watched when expected to bring forth. As soon as dropped, see that the pigs are cleaned and take the teat, and the dam rid of the placenta, and that carried off and buried. The watching should continue a day or two longer, till the pigs get a little stronger and lively, as the sows of this breed are so heavy as to endanger their being lain or trod upon and killed. One pig more saved, *than leaving* the sow to herself, amply repays *all this extra* attention. Although objections are made to giving food immediately after farrowing, I can see no reason in them; the poor animals is faint and dry, and requires nourishment, and my rule is to feed them swill in a moderate quantity, a little more than blood warm, as soon as it will get up and eat it. This is gradually thickened the next day, and by the time the pigs are a week old, the dam is allowed to eat all it will without cloying. A mixture of oat and pea or Indian meal, of one part of either of the latter to three parts of the former, is highly recommended for nursing, together with an equal quantity of steamed vegetables. As soon as the pigs will eat, a small open door should be placed in the pen under which they could run and be separate from the sows, a trough set in, and milk with a light mixture of oat meal poured out for them. This greatly relieves the sow, and adds much to the growth of the pigs; they wean then without scouring, losing condition in the least or being checked in their growth. It is generally thought that pigs do as well to be weaned at six weeks old as later, as the little milk each then gets is obtained by more or less quarrelling, and adds a distaste to their other food; besides it is a great consideration to get them off the sow as soon as possible. Eight or ten great pigs tugging at her breast for two or three months is hard to be borne, and frequently very pernicious to her teats. In weaning, all but one should be taken off, put he dam on short allowance, and in two days ake the remaining pig away, allowing it at first to draw the breast twice a day, and then diminish ill once in two or three days during a week, then urn the sow out to grass, and leave off entirely and commence gradually putting her into condition again. The Berkshires are great milkers, and must be well attended to at weaning time, or their breast will fill, become caked and swollen, and finally ulcerate and be the cause sometimes of the death of the sow.

Two litters are allowed per annum, and preference for farrowing, in this climate, is given to the months of April and September. Farther south ater and earlier will answer. A pig when first dropped is a very tender animal, and if the weather be too cold it will perish; the dam also is likely to become ravenous and devour her offspring, or reuse to nurse it. Sows are better to be always separate; but with the owner of a large herd, this is inconvenient, and adds greatly to the expense of keeping them. One must do as well as he can n this particular, but when nearly of a size and olerably peaceable, four may be kept together in a pen, and a dozen or so in a pasture. The breed greatly decides on this point. For instance, I could keep a hundred Chinese together without quarrelling or accidents, they are so good natured and quiet; but then again they huddle too close, and so want as much separating as others. These being smaller and of quicker maturity than the Berkshires, the sows may come in at a year old; and when full grown, great care must be taken about overfeeding and keeping them too confined. The bellies of this stock are now nearly dragging on the ground, though they have had no other ood since the forepart of May, than what they have found in a poor grass pasture. Those I have sold west get so fat on shack by November as to be hardly able to waddle, and make the nicest of pork without further feeding. In England, they are called par excellence, the "gentleman's hog," and though their pork inclines rather too much to at, still it is so sweet and delicate that it is more generally preferred by those who can afford it. The crosses of these with the Berkshire are in great repute at the Smithfield market, and I will add that what little has been thus made here takes he preference. The hams well boiled and eaten cold, seem absolutely to dissolve in the mouth without mastication. The average weight of my mproved Chinese may be at eighteen months old rom 200 to 250 pounds. Occasionally they will go older to 300 and even 400 pounds, but his is very rare. Though small, they have proved to the other races of hogs, what the Arabians have to horses, the foundation of all improvement.

The reader will have surmised from my observations on breeding, at least some of the causes why the Berkshires with you have not come up o the full sizes so often stated by the eastern breeder that they arrive at; but lest he may not et thoroughly understand the demerits of the case, justice to both seller and purchaser, I shall proceed to briefly state them. Suppose then, that we start with a pair of Berkshires from unexceptionable stock, the produce may deteriorate in size, either from too great affinity in blood of the parents, breeding too young, too old, or too much. Keeping too fat, (which by the way is not often the case,) too poor, or too confined; from diseases known and unknown, from runts that will occasionally be dropped, from scantiness and impropriety of food to the pig, and occasionally, over which no one has control and that check its growth, from sufferings through the inattention of the transporters to its place of destination, and finally from a general deterioration in nature. Really good animals that are every way right, are rare, very rare indeed, and when at last obtained, cannot be too highly cherished. That there may be an increased effort to produce them throughout the United States, is the ardent desire of,

Your obedient servant, A. B. ALLEN.

A PATTERN FARMING TOWNSHIP.

From the Farmers' Monthly Visiter.

Until within a few days the editor had never visited the town of Rye in the county of Rockingham, This town is situated next southwest from Portsmouth, stretching on the sea-shore six miles, and is of an average width of two miles, being one third the size of a common six miles square township. A considerable portion of its superficies is the sand beach of the sea. Its soil now in cultivation was originally hard beyond that of the rocky soil of the interior, with a pan approaching near the surface like the face of the rock itself, or else it was swamp and morass. Thirty and forty years ago the inhabitants pursued fishing as their principal occupation; and the larger portion of them were poor: it is also said that many of the fishermen, being intemperate, left their families almost in a state of destitution. The change that has since gone over them is wonderful. There is not now probably in the state a more industrious and moral community than the twelve to fifteen hundred inhabitants of Rye; and although there is no community of farmers in the country more frugal and economical, scarcely an individual among them being willing to part with a fourpence ha'penny without the assurance that it will bring back a nine-pence; yet the examples of generous charity among them are such as are worthy of imitation from those who part with their money with much less reluctance. Most of the owners of farms with their sons do the work upon the farms: if one of them is taken sick and unable to do his work in a busy season, enough of his neighbors leave their own work for one or more days to assist him, and his haying or his hoeing is performed at the proper season, "without money and without price.

The superabundant rocks in this little township have for the most part been converted into excellent permanent walls, partitioning out the grounds into convenient fields of from two to twelve acres. We met in the town the three selectmen or "fathers of the town," who were in session to close up the business of the year. These gentlemen were a true specimen of the hard hands and intelligent, honest faces that are characteristic of the tillers of our soil. With them, and the excellent friend to whose kindness we were indebted for their visit, we ascended the steeple of the large, congregational church, which has been erected more than one hundred years, and from the top had a view of the almost countless stone-wall partitions, and of fields upon which piles of manure in preparation for the coming season had already been placed. The sea, the Isles of Shoals on one of which is the White Island light, the Whale's Back and the New Castle lights, further on the steeples of Portsmouth, and in a transverse direction the harbor of Rye, being a bay formed as the estuary or mouth of a small creek running through the town, were visible to the naked eye.

From the observations made, as well as from information, we do not doubt that this little town of Rye turns out more value in the production and growth of the soil than any other town of the state. The farmers here seem to have studied in their own school of experience, which has taught them the best method of cultivating their ground. Hundreds and sometimes thousands of ox-loads of green sea-weed are annually thrown upon the beach; every storm with the wind blowing directly upon the coast brings this along: and there is competition among them which shall secure the most of this article. It is of itself the very first-rate of manure, and is either spread upon the surface before ploughing, or else upon the sward where grass is to be mowed. In addition to this sea weed or kelp, the farmers of this town within the last few years, having commenced the ditching and cultivation of swamps containing a deep vegetable mould, drawing out the matter taken from these ditches in the fall or winter to be spread over the ground along with the sea weed. This rich black mould is thrown in heaps at convenient distances, at the rate of a hundred stout cart loads to the acre: the vegetable mould under the operation of severe frost, swells and pulverizes like slacked lime. With this and the vegetable weed from the sea, and in some instances on low ground with heaps of common stone gravel, such as hard roads are made of, the largest crops are obtained. The corn is larger than that raised in the interior on the best grounds: great oats follow as a succeeding crop to the corn. But potatoes for shipping are the great staple: these the last year, carted directly from the field, sold at forty cents the bushel. In a good season, three and four hundred bushels are yielded to the acre. Some of the farmers raise three and four thousand bushels each. Most of the farms are very small in compass: thirty acres would be deemed a large farm, and it has been common for a farm of thirty acres to be divided among two or more sons of the same family, and all of them soon increase their products so that each partition will yield more than all of them did together.

In the country we have seen no such cattle as we saw at Rye and the adjoining town of Hampton. Real working oxen yoked in the teams seemed to be fatter than the fattest of those we are wont to see driven through Concord from the north and west part of the state, and from Vermont for the Brighton market. The farmers of Rye are certainly more industrious than many of the farther interior. They are working their teams constantly in the winter, preparing as well their grounds for cultivation by carting manure, as procuring their annual stock of fuel. In the article of wood and timber the people on the seaboard are much better supplied than they were fifty years ago. The white pine is more usually than any other wood used as fuel; this is of the second growth, the trees having attained almost the size of some of the original pines in the space of a few years. The butt logs up to the knotty parts are saved to be sawed into boards and plank, or for hewn timber, and the limbs above are cut and split, making good fire-wood for the stove when they become seasoned. The pines are preserved with all the care of a garden-orchard, as are the hard-wood trees in uncultivated swamps: the growth of these will yield a great annual profit on a high price paid for the land.

The farmers with a small amount of land usually keep at least two yokes of oxen, and turn them off very fat at the season when good beef for the market will bring the best price, supplying their place oftener with other oxen furnished by the country than by young cattle of their own raising. Considerable pasturage for cattle is either owned or hired out of town, the land being taken up with more favorable cultivation.

The cultivated lands of this town sell from one to two hundred dollars the acre, and sometimes even beyond that price. The inhabitants of the town change less than is usual in the towns farther interior. Seldom does the property pass out of the family. A vast deal more in value is annually produced in the town than is expended in the town, so that the people necessarily must be growing rich: the annual increase of the capacity of the land from its improved cultivation is a great increase of the wealth of the town.

Could the farmers of all our towns realize the extent of the advantage gained by so cultivating their ground as to make every acre produce two or three for one—could they witness what has been done by the industrious farmers of Rye—few of them would fail to make efforts to elevate themselves, and their calling, in that easiest method which human ingenuity can devise.

ON THE MANURING OF ARABLE LANDS BY THEIR OWN VEGETABLE GROWTH.—ROTATION OF CROPS.

(Continued from p. 56[illegible].)

No. II.

Different advantages of green and dry vegetables, as manure, compared.

Though few farmers in this country had adopted or even tried the practice of ploughing in green vegetables for manure, no one doubted their efficacy, if so used. The objections to the practice would have been raised on other grounds—such as the costliness of the mode of manuring, by all—and by some, in addition, the fear of injuring the previous fertility of the soil, by turning it up by the plough in summer, and exposing the new naked surface to the supposed danger of exhaustion by evaporation. But when Col. Taylor first announced the novel scheme of manuring the fields by their own *dry* vegetable growth, it was met by general doubt and incredulity, or by confidence of very slow growth. Before that time, there was very little manure made on any farms in Virginia, and the litter used as part of the materials of that little, by most persons, was furnished merely (and very scantily for that purpose) for the comfort of the horses and cattle; and was considered as useful to absorb the liquid animal excrement, and thus save it from waste, but as adding very little to the richness of the bulk. Still more difficult was it for the teacher to gain confidence in his claim for the *superior* richness of the mature and dry herbage to the same when in a green state. He maintained that the vegetables had not gained their full value, until their growth was completed—and in that he was certainly correct. But even though the entire plant, when fully ripe, (and, possibly, even when dry,) may contain more richness, if converted to manure, than when green and unripe, there are other things which ought to be considered. In the first place—the seeds, then formed and ripe, have been furnished, for their formation, with much the greater part of all the manuring strength which before had been spread through all the other parts of the plant; and these seeds, which if dead, might act as manure, being alive, would germinate, and instead of enriching the ground, would produce weeds, to the greater or less damage of the next crop. Secondly—to form the seeds is the great effort of vegetation, and which makes by far the heaviest draught on the productive power of the soil. If, therefore, it were convenient and serviceable, for other purposes than fertilization, to plough in, or even to mow and take off, a green crop when in its flowering state, its growth up to that time would have taken very little from the soil, and its value (whether for manure or as a crop,) would be almost entirely derived from atmospheric support. Thus, if less be gained by using the crop too early to let the seeds form and fully ripen, the cost to the land of producing the crop, would be in a still more reduced proportion. The fact (which science has completely established,) that plants draw much from air and water, and but little upon the richness of the soil, before forming their seeds, induces me to think that early mowing the first crop of clover would detract less from the value of the vegetable manure, than it would furnish of value in food, and do service by the scythe destroying the seeds of such annual weeds as cockle, spelt, cheat, &c. And if the gain from the crop of mown grass, and of the same if allowed to ripen for manure, be equal, or nearly equal, the choice of the former ought to be induced, by the consideration of the one practice leading to clean tillage and clean crops, and the other, to the foulest of both. Another thing is, that if the first crop of clover be mown before forming seeds, the second crop is so much the heavier, because of the first not having exhausted the soil to form seeds; and, being freed from the annual weeds, may be ploughed in, unmixed, as manure, before ripening seeds again, or afterwards, according to the condition of things desired.

But if the seeds of the grass or other crop of manure, could be fully given to the earth, and as manure, by the decay of the plants, and if the seeds of weeds could be kept from sprouting, I should then go even beyond the great founder of this system, in urging, and in preference, the leaving of the vegetable cover to die and decay on the surface. For he feared much loss from evaporation, in the exposure of all putrescent manures on the surface of the earth. With him, to *cover* manures by the plough was to *secure* them; to leave them on the surface, was to lose a great part of their enriching parts. In this opinion, I do not concur; but on the contrary believe, that, (if on soils capable of receiving and fixing more fertility,) the imitation of nature's mode of manuring, by letting the vegetable growth drop and decay on the surface, and year after year, will be better for fertilization, as well as for saving of labor; and that no great loss is to be feared from evaporation. The application of Taylor's doctrine led him into the great error of directing the laborious and yet injurious operation of ploughing summer cow-pens, as fast as they were moved. By this ploughing, which he did to secure the highly putrescent dung from wasteful evaporation, he quickened fermentation, by supplying the moisture which would otherwise have been wanting for that natural process; and the surface being naked, and no growth springing to take up the manure as it was decomposed, it would be indeed principally wasted, and in consequence of the very means so carefully and laboriously applied to prevent that effect. Manuring by top-dressing, and especially on young clover which is to be itself given to the earth as manure, and which is the best possible mode of applying manure, had not been practised or proposed in this country, when Taylor wrote; and it is directly opposed to his theoretical views, as well as to his practice.

Another question connected with this subject, and which must bear on any plan of ploughing in green manures, is, whether the soil loses fertility by being turned up by the plough, and exposed naked to the sun. With my great teacher, Taylor, I long held to the belief in exhaustion being so produced; and supposed that all summer tillage of corn, and fallowing for wheat, must greatly lessen the previously acquired productive powers of the soil so exposed. Other views have been more lately adopted, founded upon the theory of the causes of fertility and barrenness in soils, as set forth in the 'Essay on Calcareous Manures.' A necessary deduction from this theory teaches that in a properly constituted soil, the manure stored therein is fixed by calcareous earth, and both the calcareous and the vegetable matter chemically combined with the soil—and therefore not subject to waste by the ordinary exposure to the sun, when ploughed up. But if a soil is so constituted as not to have the power of combining with the vegetable matters mixed with or applied to it, as these matters are decomposed, they will be lost to the soil; and as ploughing them under in summer will hasten decomposition, and still more the frequent stirring and removal by the plough, so these operations will hasten the loss of the manure present. According to these views, the summer ploughing of land will serve to still more impoverish a bad soil, but do no harm to one properly constituted. And if the soil be properly constituted to combine with putrescent manures, (which is essential to any considerable or profitable improvement by such manures in any manner of application,) then the choice between ploughing in vegetables green or dry, or leaving them on the surface, should be directed by considerations of economy of labor, and suitableness of the particular process to the general rotation, more than by any absolute and uniform superiority of the one plan to another.

On all very poor lands, and which have been made much poorer than their former natural state by severe cropping, to plough in green annuals of any kind would be of more expense in seed and labor than of profit in increased fertility. And green clover, to be turned in for wheat fallow would be out of the question, because clover could not be produced on such land. The seeds of weeds would here be but a small evil, because of their small product; and a scanty cover of weeds would not be much protection to insects. Hence, for these reasons, dry vegetable manuring, and long intervals between the use of the plough, should here be adopted.

On much better land, and of soil well constituted by nature to retain putrescent manure, or made so by the previous application of calcareous manures, cleansing will be as necessary as enriching; and therefore it will be preferable sometimes to mow, and at others to plough in green crops, both of clover and of annuals, both for cleansing and manuring, and for making the rotation as much as possible conducive to the three great objects of enriching the land, cleansing the land and its crops, and yielding the greatest possible net product.

It is remarkable, (and would be astonishing to all, if the fact were not so common, and offered to the observation of all,) that every soil is so filled with seeds of weeds, that the longest known tillage, or continual close grazing, or the mixture of the two, according to the former general exhausting system of this country, has not destroyed any where the seeds of weeds, or prevented a single square yard of arable land being covered by some kind of spontaneous vegetation, as soon as tillage is intermitted long enough for any thing to grow. On the poorest and most worn-out land, on the first year of rest, the growth may be scarcely any thing but the dwarfish and slender spired "hen's-nest," or poverty grass; but still this light cover is distributed so fully over the land, that not a spot is left naked. I speak not of the broom-grass, which follows on such lands, nor of any other which like that has winged seeds, which may be wafted by the winds to great distances—but of seeds not thus provided for transportation. On our dry light soils of middling and good quality, after wheat has been reaped, the land is usually soon covered by a general and thick growth of *carrot-weed*, which rises from two to five feet high, in proportion to the strength of the land. Yet this vigorously growing plant, which has such complete possession of the land, disappears with that season, and will no more be seen, to any extent, on the same land while it lies untilled; nor until again produced in its former and short-lived abundance, by the recurrence of the former circumstances of corn tillage followed by a crop of wheat or other small-grain crop. In like manner, and under other peculiar circumstances, other grasses or weeds have almost exclusive, but only temporary possession of the land. Among the growing crop of corn, or other ground if well ploughed and cleaned of all other growth in June or July, the vulgarly called *crab*, or *crop-grass*, springs up, and grows with a luxuriance proportioned to the richness of the soil and the moisture of the season. When much favored by both the latter circumstances, this grass sometimes also follows wheat. But it never continues to keep longer possession of the land, and is rarely seen in luxuriant growth, except where the singular preparation is used of thorough tillage, designed to destroy all vegetation, in the early part of summer. This is one of the best grasses of the southern states, and sometimes furnishes to the scythe a heavy crop of excellent hay, in autumn, from some spots in the corn field; and it would be one of the most valuable grasses for hay, if its growth could be obtained year after year, and without the expensive mode of preparation which it requires.

Many other weeds, in smaller quantities, spring up with and accompany the carrot weed; and fox-tail grass, another autumn grass, has the same habits with, and grows like the crop-grass. I have only aimed to cite some of the most remarkable, for quantity and regular recurrence of growth, even though the manner of tillage and long continued other treatment of the land would seem sufficient to have destroyed every seed. Of course then, these and other weeds alike in this remarkable respect, are not to be expected to be eradicated, nor scarcely thinned, by any degree of perfection of cleansing tillage. Nor is it desirable; for these growths serve admirably to fill up intervals in the rotation of crops, and give in some degree the benefit of a green manuring crop interposed between two exhausting, and otherwise successive grain crops. In the absence of clover, or as its more rapid precursor, the usual growth of carrot weeds, which immediately follows the wheat crop, is in fact a secondary and green crop added to the rotation for that year; though probably few cultivators have so thought of the benefit, and counted this additional crop of their rotation, thus given by nature.

The most remarkable and beneficial green crop of this kind, is the Magothy bean, which covers all the light lands of the Eastern Shore of Virginia, as soon as the oat crop is taken off. This universal and luxuriant cover (for such inferior lands,) is in fact a most valuable green and enriching crop added to the otherwise murderous rotation (of 1st year, corn; 2nd year, oats,) of that part of the country; and the wild bean which fills up, and mitigates the rigor of the rotation, will not grow if more rest is allowed to the land, than is this scourging course of a grain crop taken off every successive year.

Thus, nature, by operations which are scarcely valued, or even noticed by man, works to counteract and prevent the utter exhaustion which the usual modes of cultivation would certainly and speedily produce, but for this bounty of nature in continually supplying resources for resuscitation. In fact, in the long continued wretched course of tillage which has been and indeed still is most usual in this country, there has been more or less of vegetable manuring, either green or dry, in every rotation; but it has all been the work of nature, permitted by chance, and in spite of every effort of the cultivators of the soil—whose only object was to get as many grain crops as possible in each round of the rotation, and to destroy as much as possible, all other vegetation.

The desultory observations in the preceding pages lead, though by devious and irregular progress, to a comparison of the views therein presented with the different rotations of crops in use, or recommended. Such will be the purpose of the following number.

E. R.

No. III.

Application of the principles of the rotation of crops.

There is scarcely any condition of agriculture, in the least degree advanced, or improved in operation, which is not based on some rude system of rotation, or succession of crops in a certain order. It has long been known, and almost universally acted upon, that, as to grain crops at least, the same kind could not be produced successively on the same land, without a rapid decline of product, from some other cause or causes besides the mere lessening of the fertility of the land. For when land so treated, and so reduced in product, was put under some other crop, the product of such other crop was greatly better. Therefore, except in the earliest and rudest cultivation of a new country, no where is there to be found cultivated the same grain crop, for many years in succession, without the interposition of some other crop, of other grain or of grass. Cotton is the only tilled large crop in this country which has not been alternated with other cultivation, and which is tended for years together on the same land. This practice is recommended by the clean condition of the land required by that crop, and which its repeated culture secures. But it may well be doubted whether the diseases, and enormous losses of product in this crop, are not to be ascribed to its being continued so long on the same land.

But though every farmer uses something of a rotation, still the most usual courses of crops are very imperfect and highly objectionable; and there is scarcely any scheme of rotation which does not offend greatly, in some of its features, against the correct principles or theory of rotation.

The fact of the certain and rapid decline of product of any one crop repeated year after year on the same land, was universally conceded, and the practice generally abandoned, by practical cultivators, without their troubling themselves to investigate the causes. Theoretical and scientific agriculturists have entertained different views at different times, and each has had its reign. Formerly, it was supposed, and generally admitted, that each plant drew from the soil some food peculiar to itself, and thus rapidly exhausted the soil of this its own peculiar nutriment, while there still remained unconsumed, and in abundance, the food to support plants of other kinds. But though this theory passed current long without dispute, because it served to explain the effects produced, it was gradually weakened, and finally overthrown, by later and more correct views of the nature of the food of plants. It is but within the last few years that a new and opposite doctrine has been started, which is at least the most *in fashion* at present, if not the most generally received. This is founded on the discoveries of Macaire, De Candolle, and Towers, of the *excretions* of plants by their roots; and the inference thence drawn, that the rejected excrement is fit to serve as food for other plants, but is useless, if not absolutely hurtful, to the kind from which it was thrown off. And hence also would follow the necessity for a change of crops.

Without denying or advocating either of these doctrines, I will yet add to whatever may be the main cause which calls for a frequent change of crops, *another cause*, of at least very considerable operation, and which has been already named in the first of these numbers. This is, that every plant is subject to be preyed on by its own peculiar tribes of insects, which are continued to be supplied by their proper food, and favored by the still continuing circumstances of the field, and therefore are increased continually in numbers, and in their destructive ravages, so long as the crop which fed them, and the circumstances which favored them, remain unchanged; and that these insects must be destroyed, or greatly reduced in their numbers and powers of mischief, by a total change of the growth, and of the treatment and condition of the field. Perhaps these depredators may be invisible, from their minute sizes, and yet so numerous as to cause any extent of injury that is found to be suffered by unchanged tillage of any one crop, and which is avoided by convertible husbandry, or a rotation of crops.

But luckily, though the causes of such evils may be uncertain, the effects and the remedies are not therefore unknown. And the observations of both scientific and practical agriculturists have served to establish what have been termed the *principles of the succession of crops*, which furnish a body of rules by which to test every particular scheme, and show its advantages and defects. But though most of these principles and the rules founded on them are universally received, still perhaps every writer and reasoner upon rotations differs in some important respect from all others; and my own views, and still more the rules and applications founded thereon, which have been and will be offered in these numbers, have no authority, either in previous precepts, or examples of practice. The adoption of the above named and new reason for a rotation of crops, would alone require the introduction of new rules in determining a proper order of succession, and a considerable departure from the stated rules prescribed by any previous writer on this subject. But though the principles and rules laid down by every modern and well informed agriculturist may have differed in some respect from all others, and even if all were wrong as to the main *cause* of the necessity of changing crops, still all were right, in the main, in their general precepts and rules of ordinary procedure.

But though many scientific writers have laid down the principles of proper successions of crops, and all modern agriculturists in writing or in practice, have advocated particular rotations, still scarcely any two agree fully in their rules; and agreement in practice seems more the result of old custom, and neighborhood example, than of thinking and reasoning. It is manifest that no particular course of crops can be prescribed as the best for an extensive agricultural region, nor even for the fields of different soil on the same farm, nor for the different conditions, at different times, of even the same field. It is as much quackery to direct the same rotation for an extensive region, as it is to prescribe the same medicine for all diseases. When we hear of a particular rotation (no matter what,) being generally pursued throughout a large district, it is pretty good evidence that the rule is pursued from custom, and not by reason. Some of our best farmers have no regular rotation, though always aiming to observe the sound principles of the succession of crops, by varying the succession according to the changes of circumstances.

But if neither reasoning nor precept can point out always aright or perfect rotation, it is easy enough to learn from both what is wrong and injurious. And we can scarcely find any regular rotation in this country, which does not offend against some admitted principle and rule, and the most common have scarcely one redeeming quality, no matter by what test, or principles, the practice be tried.

The most important, and indeed *indispensable requisites* of any good scheme of rotation, or course of crops, I take to be the following; and the observance of them may be termed the *three primary rules for rotations*. 1st. That the several crops which form the course, are among the most *profitable to the cultivator*, in the circumstances in which he is placed; of climate, soil and market. 2nd. That the whole course of crops, taken through, is *profitable to the land*—serving to increase its productiveness, if poor—and at least retaining its productiveness, if already rich. 3rd. That each crop in the rotation *serves to prepare for and aid the cultivation and production of the next* which is to follow it, instead of obstructing either, or both.

The two first of these requisites, either expressly, or by implication, may be considered as embraced in every theoretical scheme of rotation, and aimed (however ineffectually) to be preserved in every judicious farmer's practice. The third is almost disregarded by all, and is certainly not by any placed in the important position, or viewed in the light, which I think it deserves.

If all these three requisites be secured, any rotation will be good; if either be neglected, or be but imperfectly secured, the rotation will certainly be a bad one. The best devised rotation for the improvement of the land and its products, and perfecting the tillage, would be inadmissible, if any of the crops were of such kind as not to be either sold, consumed, or otherwise profitably used, by the farmer. Neither would the greatest annual sales justify another rotation, if it worked to impoverish the farm. And even if the kind of crops were to be the most profitable, and the improvement of fertility regularly advancing, what will it profit the proprietor, if the rotation operates to produce weeds and depredating insects in such numbers as greatly to increase his labors, and also to diminish their products?

Scientific agriculturists have laid down so many principles, or rules, to be observed in planning rotations, that it is impossible in practice to observe all, or perhaps half of them. Thus the English writers insist, perhaps more strongly than on any other point, that green (or grass and roots, or leguminous) crops, and white (or grain) crops, should regularly be alternated. Others, that tap-rooted plants should alternate with fibrous and shallow rooted. But all these are minor considerations compared to the foregoing; and each or all of them might come in conflict, in the circumstances of this country, with one or more of the more important and indispensable requisites.

The first rule which I have above stated, that the crops should be among the most profitable to the cultivator, is almost the only one which directs the farmers of this country; and yet even that object would seem to be lost sight of, in the miserable and futile means used to reach it. The nature of the soil and its absolute unfitness for other crops, had generally caused the selection of some one or more suitable crops for each agricultural region; and when once thus forced upon the cultivators, the custom of the place has made this course of cropping general, if not universal, through that region, though numerous exceptions, even if the general rule were good, would be demanded by differences of soil, or of other circumstances. Thus, Indian corn is the great crop of lower and middle Virginia, followed by wheat in the upper and richer part, or by oats where the soil is quite too poor or too sandy for wheat. A young farmer, who commences operations without any consideration of the wants of his soil, or of the market, adopts the usual crops of his neighborhood. If wheat be the small grain generally raised, he sows it even on his most sandy and his wettest arable lands. His corn-culture is as large as his land and his labor permit, and is pursued without change, even though some years the market price may be (as it has been in lower Virginia) less than 25 cents the bushel. Yet, during this time, and every year, Irish potatoes, brought from New England, are selling in all our towns, (and bought too by many of the farmers,) at $1 the bushel; and thus the product of 20 acres in corn, or in wheat, is exchanged for that of half an acre in potatoes. Yet we can make, in lower Virginia, as good potatoes (I have often seen better,) than any brought from the north. By a still more unaccountable improvidence and absence of all calculation, hay-making is totally neglected, even on the rich and wet low-grounds of the Roanoke; and where the soil is the most admirably suited for grass, it is regularly and most laboriously ploughed and tilled, to produce bad and very precarious crops of grain. And, to come to smaller and more frequent departures from this rule, we may see on almost every farm which has various soils, the most intractable clays put in corn, which requires a sandy soil—wheat on sands—the steepest lands and most liable to be washed, subjected to the plough, and also the wettest spots, even though their laborious tillage may obtain scarcely any product of grain. The observance of these neglected minor points (and yet very important to profit,) would alone produce a great reformation in our farming.

The second requisite, (that the course of cropping should permit the improvement of the land,) is aimed to be secured by but a small proportion of our cultivators; and the third rule by still fewer.

Under peculiar circumstances, either one of these requisites may be so increased in importance, that the others may be, and ought to be, for profit, comparatively neglected. Or the object of either may be made so easy by peculiar circumstances, and by the use of means not belonging to the farm, that the otherwise necessary security of that object, from the rotation, may be neglected. Thus, where the neighborhood of a town offers to a farmer regular demand and high prices for roots and hay, and dairy products, it would be foolish for him to make grain or tobacco his most important crops, which others, at ten times his distance from market, could produce even more cheaply. And with the means of purchasing town manures, he would wisely adopt what would otherwise be a too severe and exhausting rotation of crops.

I shall now proceed to subject to the test of the three rules which have been laid down, the most common rotations of eastern Virginia, as well as some other schemes which may not yet have been tried sufficiently, if at all, in practice, but which seem better adapted for profitable, easy, and enriching cultivation.

The first and most humble attempt at a rotation in this country, and the one which formerly was general on the greater part of most farms, and is even now in extensive use, is the *two-shift;* which, however, short as it is, had various grades of bad quality. This usually followed the *continual* cultivation of the land, in its newer condition, in tobacco, while rich enough for the crop, and afterwards in corn, every year.

The two-shift was most usually this:

1st year, corn—
2nd, wheat—or oats, if on land too light or too poor for wheat—
after harvest, grazed closely until next spring, when ploughed for corn again.

When too poor to bear any small grain crops, that part of the course was omitted on such poorer spots of the field, and afterwards on all—thus changing the rotation to

1st year, corn—
2nd natural cover of weeds, grazed.

When not grazed the second year, as was sometimes the case, for want of separate fencing, or some other cause, this rotation made a nearer approach to alternate and improving husbandry. It was then

1st year, corn—
2nd, weeds not grazed, and which (if not burnt off, as was done most usually,) formed a very poor *manuring* crop.

The celebrated Eastern Shore rotation, is of two-shifts or fields, but of three crops, in the two years. This is

1st year, corn—
2nd, first crop, oats—
secondary crop, Magothy bay bean—

a spontaneous and close cover immediately succeeding the oats, and which remains mostly or entirely untouched by the grazing stock, and is ploughed under for the next crop of corn. The interposition, by nature, and not by the design or industry of the cultivators, of this leguminous and manuring crop, is a most valuable feature in a rotation which otherwise would be altogether exhausting and destructive. The moisture of the air, no less than the sandiness of the soil, and the cleanness from other plants, give vigor to this bean, and make one-third of the whole course meliorating, to two-thirds of exhausting crops. The same moisture also nourishes the oats, and prevents that crop exhausting so much, as in dryer regions—and also by its greater bulk of straw, furnishing more materials for manure. These circumstances render this rotation, severe and barbarous as it is, less exhausting (or more improving, if much attention is paid to manuring,) than the ordinary three-shift rotation. Except in the chance-made addition of the spontaneous bean crop, this rotation offends against every principle and rule which ought to govern.

The *three-shift* rotation was the next step in the supposed march of agricultural improvement, and even yet is that which many remaining two-shift or no-shift cultivators aspire to reach, as the limit of their farming and improving ambition, and their *ne plus ultra* of mild cultivation. This was—

1st year, corn—
2nd year, wheat, and afterwards the spontaneous grass and weeds grazed—
3rd " pasture, closely grazed.

The severity of the second year was generally moderated on the poorer parts, by the wheat being there necessarily omitted—which of course gave to those parts two years rest from tillage, in three; and, while the wheat was growing, a cessation from grazing also. With very few exceptions, such was the general system of the best cultivated farms in lower Virginia, when Taylor wrote; and it is on this kind of three-shift rotation that his denunciations were so deservedly cast. This rotation violates every sound principle and rule, and certainly deserved to be treated without mercy; but many have continued to denounce the three-shift rotation, even when rendered comparatively mild, as if the evil was in the *number three*, and not in circumstances more important than the mere number of shifts.

But taken in the aspect above described, and which was the best then that was exhibited, the three-shift rotation had no merit whatever. It had no other than fibrous-rooted plants; no other than narrow-leaved crops; no root, leguminous, or even grass crop—for the close grazing merely served to prevent the scanty weeds and grass from growing; and while every year's crop was exhausting, the system furnished but small resources and materials for manure. For the grazing animals were as many as the land could keep alive, and scarcely any were fattened (by grazing alone,) for home consumption or market—and their support served to diminish, instead of adding to, the fattening or manuring of the land. At that time it would have been difficult for a reading farmer to *comprehend* this undoubtedly sound maxim of English writers, "the more cattle kept, the more grain or other crops produced." But the English farmer *keeps* no animal except for the profit it will yield; and all that are so kept, give their rich and abundant products of manure, as an additional profit to the soil. But when a stock of cattle, sheep, and hogs, can barely make out to keep alive through the year, and never fatten, except by stall and grain feeding, then keeping them certainly yields no clear profit to their owner, and their close grazing of the fields takes away more of fertilizing materials, than their dung can possibly replace. An English or French farmer would be no less at a loss to comprehend the object (or even to believe in such a general practice,) of keeping a large stock of animals from which no net profit was obtained, or even hoped for; and he would justly think that it would not be more absurd for a farmer to tend a crop of grain, and then leave it to rot on the field, than to give all his grass through summer to animals, and then lose the flesh so acquired, by starvation through the winter. Indeed, the general cattle management of this country would scarcely be believed in any good grazing or farming region. On the farms under the usual three-shift rotation, say of 400 acres of arable land, there would be from 40 to 60 head of grazing cattle, which furnished annually to the owner, at most, about as much milk and butter as two well kept cows might supply—one or two passable beeves, with the aid of grain feeding, a few poor calves for veal—and a pretty large supply of *hides* from deaths by starvation in the spring. There were hogs enough to furnish the year's supply of bacon; but only by means of grain feeding, which alone was admitted to cost nearly or quite as much as the market price of the meat. A flock of poor sheep were on some farms also, of which, before shearing time, half the wool of many was hanging on the briers, and the remaining fleeces filled with burs. This sort of grazing system accompanied the old three-shift rotation; and inveterate as were old habits, and patient as we are of long-borne grievances, this evil was so great, that none could deny but that the mere expense of the dividing fences, necessary to keep the cattle from the fields of grain, cost more than all the returns from the grazing animals.

The *four-shift* rotation, recommended and practiced by Col. Taylor, was—

1st year, corn—
2nd " wheat, and clover sown—or if too poor for wheat, left at rest, and not grazed—
3rd " clover, (or weeds) not mown or grazed—
4th " clover, not mown or grazed.

This rotation, as before stated, was the first introduction of manuring fields by their own vegetable cover, and this practice, and the admission of the opinions on which the new practice was founded, was a prodigious step towards agricultural improvement. It is true that even this rotation is opposed to the rules of good husbandry, in most respects. But the giving of two and a half years out of four for vegetables to grow, that were to die and decay on, and be finally ploughed into the land, was a feature that compensated for every fault, and made the rotation decidedly meliorating, if on land capable of being enriched by the mere application of vegetable matters.

In the first of these numbers, it was stated incidentally to other matters why this rotation became of less benefit and more objectionable, in proportion to the time, and to the effect with which it operated; and if it improved the productive power of any land, that it also greatly increased the labors of tillage, and the destruction of products, by increasing weeds and noxious insects. In consequence of this objection, very few disciples of the great introducer of and advocate for this rotation have continued long to pursue it strictly.

The *four-shift* and *clover fallow rotation* differs widely from that of Col. Taylor. This has been, and I believe still is pursued with great success by Hill Carter, of Shirley, John A. Selden, of Westover, and has been on some other of the best lands on James River, where it has since, in other hands, been either neglected or abandoned, for some modification of the three-shift rotation. This four-shift system is

1st year, corn—
2nd " wheat, and clover sown, and not grazed—
3rd " clover, not grazed, and ploughed in deeply in August and September, and the field sown in wheat—
4th " wheat, to be followed by corn, in recommencing the rotation next year.

A sufficient standing pasture was kept on other land. Mr. Carter, for a considerable length of time, substituted oats for corn in the first year.

The farmers above named, (whose accounts of their systems and their products were reported at length in vol. i., Far. Reg.,) and others also, undoubtedly made great crops, and great improvement of land, under this very severe rotation. But those results were due more to the excellence of their general management that to their rotation. None but admirable executive farmers can possibly overcome the great difficulties which accompany this rotation. He who, in our dry climate, on a stiff or even medium soil, can plough every August and September one-fourth of all his arable surface, to the depth of 8 or 10 inches, and turn in and cover effectually a heavy coat of clover—and this without failing in any year—shows thereby alone his ability to execute the most arduous undertakings, and to *do well* every thing which he may make a part of his general plan of operations. This rotation, in such hands as have directed it, has some admirable features; but it must be executed in the most perfect manner, or these best features are lost, and there will remain only the great evil of three fibrous-rooted, narrow-leaved, and exhausting grain crops, in succession.

The great merit of the four-shift rotation, in general, and considering it as embracing both of these very different varieties, is its easy adaptation to more mild or more severe cultivation, without any different arrangement or number of fields. Thus, Taylor's rotation may be rendered still milder (as is needed on the poorest lands,) by omitting the wheat crop; and as the land improves, the richer spots may be thrown under the more severe cultivation of the other four-shift system, as practised by Mr. Carter or Mr. Selden. But, in any form, the rotation still remains objectionable, for the succession of grain crops, (if there are even two in the course,) as well as for other things, in one or the other variety, which have been already stated.

Every rotation yet known in Virginia is more or less objectionable upon one or more of the following grounds:

The adoption of certain usual crops, without regard to the various qualities, and the wants of the soils, or even to the demand of the market. Thus every farmer is sure to make corn and wheat (or oats,) his principal, if not his only crops. Thus the fields are deprived universally of the most improving culture of roots, which dip into and draw from the soil deeply—and of pea-crops, which feed on the air, and give the product to the soil as manure—and of all annual green manure crops, which would cleanse the soil by their getting in, their growth, and ploughing under, as well as manure it; and the store cattle and hogs suffer for the want of roots and other succulent food, and those which are necessarily well fed, consume grain almost exclusively. Besides these and other objections, which any good practical farmer, or sound theorist, would make, I would further object to the great defect of the preparatory crop not serving to destroy the weeds which will obstruct, and the insects which will prey on, the succeeding crop. Two great exceptions to this last general fault are presented when wheat follows clover, or tobacco, both of which are plants of the broad-leaved kind, unlike in all respects to the succeeding *crop, and of such* unlike conditions also, that it may be presumed that the growth of either has served well to destroy many of both the weeds and insect depredators which are injurious to wheat. Accordingly, these two crops are the best forerunners of wheat; which after them always is an excellent crop for the land and the season.

Every well informed farmer will agree to the importance of there being more meliorating crops introduced in our rotations—more grass, peas, beets, and broad-leaved vine crops. But the objection always is to making crops for which there is no sale, or market demand. But suppose there is no direct sale and money profit made from hay or roots—they will yield as much profit by being used to feed and fatten (*not merely to keep alive*) the necessary farm stock, and thus allow to be sold the corn and other grain which would be otherwise consumed by the animals, with less relish, and less benefit.

While roots are totally wanting in our rotations, one important office is left unfilled, that is, the deep-piercing of the soil and thorough opening of it by tap-rooted and tuberous rooted plants. Another thing wanting, is the ploughing under of pea or other annual green crops, to cleanse, as well as to manure the soil. These properly introduced, and the grain crops separated by green crops, would produce rotations far more improving to the land than any yet known, and probably as much better for early annual income as for improvement of the land—the farmer's best capital.

It is greatly to be feared, however, that root culture on a large scale, forming a part of the general rotation of crops, cannot be profitably adopted in this country, owing perhaps to the defect of our climate. Turnip culture was the great means of improving agriculture in England; and, as there united with sheep and cattle fattening, the turnip crop is the most enriching of the rotation. But here, turnips are considered among the most exhausting of cultivated crops; and besides, too uncertain in product, and of too little profit, to be admitted into a general or regular rotation of crops. But perhaps the experiment may not yet have been fully tried; and even if turnips are unsuitable, perhaps some other kind of roots more suited to a warm and dry climate, may serve the purposes of turnips.

We have in this country a class of crops which are not known in European rotations, or scarcely in agriculture, and which may come in admirably as part of a rotation, and serve the ends of all the three rules. These are annual vines, such as pumpkins, squashes, cimblings, and melons. These plants, though requiring rich soil, must by their broad leaves draw the most of their support from the air. By the early tillage which they require, and the thick and smothering cover which they afterwards afford, they serve to cleanse the land; and on this account, and also by the total change of kind, and of circumstances, they must be good precursors for the narrow leaved grain crops. But these are mere theoretical views, as these valuable crops have been heretofore cultivated almost as sparingly, and with as little attention to their cost and profits, as has been done in Virginia in regard to root crops.

E. R.

FINE WOOLED SHEEP.

From the Farmer's Monthly Visitor.

Hopkinton, March 1, 1839.

Dear Sir:—I have seen in the last number of the Farmer's Monthly Visitor, page seventh, an account of the purchase and stocking with sheep of the Burleigh farm in Dorchester by President Lord of Dartmouth college. In the account given, a very unfavorable allusion is made to the fine Merino and Saxony sheep, as requiring the utmost care and the most tender treatment. I also find in the second number of the same work, page eighteenth, a declaration that the native New England sheep are more hardy and less liable to disease, than the finer breeds; and that an opinion is suggested that they may be kept at as good advantage. I am not prepared to say that the native sheep of this country may not be raised by the farmer at a profit, if they can be found; but I know of none that are not more or less mixed with the finer kinds. I greatly misjudge, if the advantage is not very much in favor of finer breeds, and the finer the greater the profit. I am also extremely deceived if they are not kept through the year at as little expense as the natives, and at much less trouble. Native sheep are uniformly tall, long, lank, and coarse wooled; untame, great racers and expert jumpers; vexing their owners, and frequently the whole neighborhood by visiting every field and enclosure they wish. The Saxony and Merino sheep, which produce the finest wool that is known in this or any other country, are shorter legged than the native breed, more round and plump in every part of them, and easily fattened. They are more quiet and peaceable in their disposition, and with ordinary care of fences, seldom if ever stray from the pasture where they are put. They afford mutton equal to any other kind; their quarters being round and full, mild, tender, and fine flavored. They are the smallest sheep I have ever known. This I consider an advantage rather than a disadvantage. They are not like our oxen required to perform labor. They are kept for their flesh and fleece only, and from long observation I am convinced that it requires the same quantity and quality of food to make a hundred pounds of mutton, or a hundred pounds of wool, whether it be given to small or large sheep.

As regards diseases of fine sheep, I know of none that may not be visited upon the natives, which are equally liable when brought together in as large flocks. In my own flock I have never known any contagious disease, if I may except a flock of fine sheep of one hundred and twenty-one, which I took in the fall of 1827 for the term of one year. When I took this flock, they were all diseased and lame with the foot-rot. I found them extremely poor, and some of them unable to walk, and feeding upon their knees. During the year I lost nine of them by poverty and disease, and two by casuality. At the expiration of the term I divided equally with the other owner one hundred and ten old ones, and at the thirds, thirty six lambs, all perfectly healthy and in good order. With this exception, I have never known any contagious disease to trouble any sheep I have had the care of. I seldom lose one in any way, and am equally fortunate with my lambs, when not troubled by foxes. At the yeaning season of 1837, one fox killed from my flock, and carried to her young, seventeen lambs in four days and nights. I had a number killed at other times, and my loss in lambs by foxes that season was from fifty to sixty dollars.

I am one of those who believe things should be told as they are. I should feel hurt were I to lead any one astray from his interest by any thing that I have said, and as some proof of the truth of the foregoing, I here give an account of the income of my own flock. My average number of sheep at the shearing season, in eight years, from 1831 to 1838 inclusive, has been two hundred and forty-one. I have received in cash for sheep and wool sold from my flock during that time, four thousand, five hundred eighty-four dollars and seven cents; giving a yearly income of five hundred seventy-three dollars and one cent, or at the rate of two dollars thirty seven cents and a fraction a head, a year.

When it is considered that six small fine sheep may be kept on the same food that would be required to keep five large coarse ones, which I have no doubt is short of a reasonable estimate, a preference for the fine flocks will be more apparent.

I shall be likely to retain my partiality for fine sheep till some one gives an account of a more profitable flock of coarse ones of an equal number.

STEPHEN SIBLEY.

ARTIFICIAL INCUBATION. THE ECCALEOBION.

A highly curious and interesting exhibition, especially to the physiologist, is now open at Pall Mall, opposite the Opera Colonade, called the Eccaleobion, a contrivance for hatching eggs by artificial heat. It differs from the Egyptian method of artificial incubation by means of *mammals*, or ovens heated immediately by fire which was tried in Paris by De Reaumur; and in London by Mr. Mowbray; and also from the more recent attempt at the Egyptian Hall by means of steam. In what way the heat of the Eccaleobion is produced, we are not informed; probably it is by hot water: certainly the operation is simple and effective, as abundant living proofs daily testify.

In an oblong wooden case, about nine feet in length, and three in width and depth, entirely isolated, and divided into eight compartments, each closed by a glazed door darkened, the eggs are placed on cloth, without any covering; here they remain for twenty-one days, the period of incubation; at the expiration of which time, the chick liberates itself, and the next day is running about and pecking its food as lively as if it had the hen's wings to shelter it. The Eccaleobion is capable of containing upwards of two thousand eggs, and of hatching about a hundred daily; and though some failures occur from natural causes, the machine, unlike the parent bird, never addles the egg.

It is always contrived that one compartment shall exhibit the last stage of incubation; and this being open, the visiter may not only hear the faint chirp of the imprisoned chick, but watch its attacks on its oval cell till having broken the shell all round, it bursts the integuments and liberates itself. At first emerging into this new state of existence, the light and the human eyes gazing on the little chick, together with its extreme weakness, make it appear as if it would fain retire into its confinement again; it staggers, closes its eyes, and falls down in an apparent exhausted state, but soon revives, though but for a short time; as soon as it can take food, however, it gains strength rapidly. In the last stage of incubation, the egg may be held, in the hand, or placed in a lady's bosom; where, if any fair visiter be so minded, the chick may come to light.

In the case fitted with lenses, placed before eggs in different stages of incubation, lighted by gas, the appearances through the shell may be observed; and on a table are place the contents of several eggs at successive periods of incubation, showing the formation of the embryo, from the first day (as seen under the microscope) to the complete bird, coiled up in its oval form; to trace the gradual developement of the eyes, the bill and the cranium, the heart and circulating system, the feet, feathers, &c. is exceedingly interesting.

The fledgelings are placed in partitions and supplied with food, and the room rings with their chirping.

The Eccaleobion process is of course applicable to eggs of every species of bird, but none others than those of the common gallinaceous fowl have been reared: parties bringing the eggs of other birds, however, can have them hatched by the machine, as the same temperature (about 98 degrees of Fahrenheit,) is applicable to all, from the wren to the eagle. The introduction of the Eccaleobion into general use, will supply abundance of fowls for the table, at a very cheap rate, and with little trouble. The machinery of the Eccaleobion is also applicable to a variety of scientific purposes, where an even and prevading temperature is required; as it may be regulated at pleasure up to 300 degrees of Fahrenheit. We gather this information from a very intelligent pamphlet, bearing the title of the exhibition, by William Bucknell—the inventor we suppose—that is sold in the room.—*Eng. Paper.*

THE BROWSING OF SHEEP, DURING THE CONTINUANCE OF SNOW.

[The following article may not aid the practice of many of the readers of the Farmers' Register. Nevertheless, it is interesting even as a practice suited to peculiar circumstances, and also as showing the nutriment furnished by the branches of trees alone, for the support of sheep.—*Ed. F. Reg.*]

From the Farmer's Monthly Visitor.

Two of the most successful wool growers within the knowledge of the writer are Stephen Sibley and Joseph Barnard, Esquires, living in the immediate neighborhood of each other in the adjoining town of Hopkinton. These gentlemen, from the choice flocks which they possessed, have been able to sell their wool at their own doors at high prices when the ordinary wool could hardly be disposed of at any price. Mr. Sibley has a mountain pasture extending over the back of old Kearsarge which he has recently cleared; from ten acres of it the last season he had a fine crop of rye, which he carted fifteen miles in the straw to his own homestead.

Below is presented a letter from Mr. Sibley, which we find in a Maine agricultural paper published three years ago, and in which he describes at length his method of feeding sheep on browse in the winter. We have no recollection of before having seen this letter, although we have had a similar description from the mouth of Mr. Sibley.

This gentleman may be relied on as a safe adviser, because he has had many years successful practice in the rearing and keeping of sheep. His system of browsing, we believe, is continued at the present time. His letter contains valuable hints to wool growers:

Hopkinton, N. H. Oct. 25. 1835.

My dear sir.—On the return of your uncle I was told you wished to know my method of browsing sheep. * * * As soon as the ground is covered with snow I browse my sheep daily. I go to the woods and make one or more temporary cribs by placing two poles parallel 18 or 24 inches apart upon two handfuls of brush or billets of wood. Between the poles I place or set my boughs of hemlock or hard pine—(probably spruce, fir, or cedar will do as well)—thrusting the butt ends into the snow and having them lean the same way. I extend my cribs till they well accomodate the number of sheep I wish to feed. I then tread down the snow about the cribs so that sheep can easily pass by those that have reached the browse and are feeding. I then turn my flock to the cribs, and my work is done. In the latter part of the winter, when the snow is sufficiently hard to bear up the sheep, I thrust the boughs, when cut off, into the still snow, in rows without poles, but so close together as to prevent the sheep passing through them.

Three winters ago when I began to browse my sheep, I cut my browse and threw it about at random; but I soon found my sheep too nice to feed in that slovenly manner. They would run over it and leave it. I took the hint of arranging in the way I have mentioned, from nature, for I have observed where broughs pendent from the trees were sufficiently low to be reached by the sheep, they would go directly to them and feed more freely than in any other way. Sheep are not pleased with having their food touched even by the hand of man.

The advantage of browsing sheep is no longer doubted here. It gives them exercise, fresh air and green food during the whole winter. I drive my sheep in flocks of from fifty to one hundred nearly a mile every day, unless the weather is very tempestuous, and they heed cold weather as much as the deer or moose that range about the White Mountains.

A farmer in this town wintered about seventy-five sheep wholly on browse and a gill of corn a day to each. His flock were not at the barn during the winter, and they come out of the woods in the spring in fine order. He was fortunate with his lambs that season, and the following fall sold his wethers to the butcher for four dollars a head. I believe he had a slight covering to protect his sheep from storms. I give no grain of any kind to my sheep, except to my lambs the first winter, or to a few old ones that may be feeble; to these I give at the rate of a quart daily to twenty-five. To my breeding ewes I give half a gill a day for three or four weeks before they yean. I keep my stalls dry and airy, and daily brush every straw they leave from their cribs. For the last three winters I have wintered 274, 367, and 27[illegible], and have lost but two during the three winters. My breeding ewes last winter numbered 127—of which seven proved barren. I had two lambs killed by a fox—two died by taking cold after castration—one from being trod upon when very young, and one came too feeble to live, and died—loss in all, six. I have since disposed of five, and my lambs now number 109, and a more plump, healthy and beautiful flock I think cannot be found in New England.

I have lately sold 68 of my old sheep, and my whole flock now numbers 811. I have brought up my flock mostly from Merino ewes, and they are now from full blood Saxony to those made nearly so by breeding from the finest Saxony bucks for nine years. My fleeces averaged 2 lbs. 6 oz. and sold at 75 cents. My store sheep sell from 3 to 10 dollars a head. Yours, &c.

STEPHEN SIBLEY.

P. S. Since the foregoing article was put in type, Mr. Barnard has exhibited at our office a beautiful silver medal of the New York American Institute with this inscription on one side:—

"*Awarded to Barnard and Sibley for the best American Wool,* 1838."

The other side contains the arms of the state of New York, surmounted with the words "*American Institute.*"

It is much to the credit of Messrs. Barnard and Sibley, and honorable to the granite state, that these gentlemen should have exceeded the wool-growers of any other state in the quality of their wool; that they should give to our state the name of producing, at the extensive exhibition of the New York American Institute—which has become an Institute for the whole United States—"*the best American wool.*"

During the year 1837, Mr. Sibley disposed of about one hundred and fifty of his fine wooled sheep for exportation to Buenos Ayres in South America, *some of which were sold after their arrival as high as seventy dollars each.* These sheep were about 7-8 Saxony blood, crossed on fine wooled Merino: they were sold at a time of great depression in the price of sheep in June, when the prospect for wool was poor indeed. Mr. S. obtained five and a half dollars for the unsheared, and four dollars each for the sheared sheep. His finest wool that year was sold at fifty cents the pound.

DEEP PLANTING.

From the Boston Cultivator.

A patron of ours informed us a few weeks since, that while taking his fodder, he discovered a great difference in appearance between two pieces of corn, which were planted at the same time, and in the same kind of soil. The fodder on one piece of ground dried up so fast that he could scarcely get through with stripping it before it was entirely burnt up, to use the common phrase. On going to the other piece, he found it green to the ground, and in good plight for stripping. He was struck with the difference in the two lots of corn; and on reflection recollected that on getting ready to plant his corn in the spring, he ran a furrow with a large shovel or bar-share plough, after which he followed with a small plough called a bull-tongue, running it pretty deep in the same furrow, till he got perhaps half over the piece, when he concluded to plant the balance in the single furrow, and discontinued the use of the bull tongue. The result was, that the part planted deep in the opening made by the small plough, where the larger one had previously been run, produced a third more fodder, and of a better quality than that planted in the shallow mark made by the large plough alone; besides the great difference there must be in the weight of the corn, the latter drying up too fast of course to make a proper article for bread. This should be remembered by farmers, and the evil of shallow planting avoided, especially since all seem to think the seasons are becoming shorter, and much dryer than formerly.

PETITION OF THE AGRICULTURAL SOCIETY OF ALBEMARLE FOR THE ESTABLISHMENT OF A BOARD OF AGRICULTURE.

August 5th, 1839.

At an adjourned meeting of the Agricultural Society of Albemarle, James Barbour, sen'r., Wm. C. Rives and Frank Carr, were appointed a committee to draft a memorial to the legislature of Virginia, urging upon that body the establishment of a Board of Agriculture for the state, and to circulate said memorial, thereby soliciting the co-operation of those friendly to its object.

Teste, **Frank Carr**, *Secretary A. S. A.*

To the Legislature of Virginia.

The Agricultural Society of Albemarle was founded some twenty years past, by some of the wisest and most patriotic citizens of the commonwealth; among whom were their first president, the late James Madison, and his distinguished compatriot and friend, the late Thomas Jefferson. Associated under such auspices, and having in view an object of such general and high importance, it presents itself before the legislature to invoke its fostering aid in behalf of agriculture.

The views of the society, were there a reasonable hope of success, would extend to the establishment of a professorship of agriculture—a board of agriculture, and an experimental farm. Taught moderation, however, by the ill success heretofore attending their efforts before the legislature, they content themselves with asking now for the creation of the board—the members to be appointed by the governer, and to be selected in equal numbers from the four great divisions of the state. The number at the beginning to be twelve—the compensation to be the same as that allowed to the members of the General Assembly, with an allowance for the contingent expenses of a clerk, printing, &c. Their sessions would be limited to a few days, and the amount of the cost of such sessions could not exceed a thousand dollars. And to what purpose could a sum of that amount be appropriated with a prospect of a fairer return? It is about equal to the expenses of one day's setting of the legislature. The Society will not permit itself to believe that an elaborate enumeration of the benefits of the measure they recommend need be made to the legislature, many of whom (and it is fervently wished their number were greater) are agriculturists. Let a few of the more prominent considerations in its favor suffice: It is known to the legislature that such an establishment exist in every elightened government in Europe; where the welfare of the people actuates their policy—but, particularly in England, whose good fortune it has been to take the lead in cherishing the arts and sciences.—And it is an important truth that ought to be deeply impressed on the mind of every legislator, that agriculture has advanced hand in hand with such establishments—that while the small outgoings to sustain them have returned in benefits an hundred fold; the countless millions squandered in schemes of lawless ambition and in ruinous wars have left no monuments save of the folly and wickedness of rulers and of the sufferings of mankind. And it is submitted to the sober reflection of the legislature whether the dedication of a small portion of their time to the important interests of agriculture, might not be as profitable as when spent in the endless political strifes that exercise so baneful an influence on the quiet and happiness of society.

A board of agriculture, composed of twelve of the most intelligent cultivators, could not fail to concentrate a great mass of agricultural information now confined to a few, but then to become the property of all. It is not merely the knowledge we now have, but we may confidently count on its continual increase which could not fail to ensue by a communication with each other. The errors into which they may have fallen, and of consequence, prevail in the regions they represent, by this communion would be detected and exposed; and being a rallying point which would attract to it the affections of all who take an interest in the subject, all would contribute to the usefulness of the establishment, by communicating whatever was calculated to further the objects of its creation. Information would be sought by such a board, by carrying on correspondence with similar institutions, whether in this country or in other quarters of the globe. With these funds of intelligence the board might prepare a code of agriculture, combining all the new, well established principles of husbandry, and to be progressively improved by successive discoveries. Nothing has been productive of more mischievous consequences than pursuing, in the absence of a better guide, treatises on agriculture adapted to different climates and different circumstances—as pernicious as the acts of a foreign legislature, ignorant of the wants and the condition of the distant people for whom they legislate.

The society will not resort to the threadbare and disgusting theme of exhausted fields, dilapidated houses, and an impoverished and emigrating population—for it is not to your sympathy they would appeal, but to your justice—It is not a favor they ask, but a right they demand. The cultivators of the earth pay directly into the treasury nine-tenths of the revenue. Has a solitary farthing been expended directly in their favor, although agriculture is the most important, and at the same time, from its complication, the most difficult to acquire among the pursuits of life? They have seen, and without regret, portions of their hard earnings expended on objects proper in themselves, but when compared with the improvement of husbandry, insignificant. They now ask that something may be done for the very foundation on which the prosperity of the state reposes.

Small as may be the dispensation now required, compared with what they have a right to demand, they console themselves with a hope that when the advantages of a board of agriculture shall be developed, the legislature will continue to manifest its patriotic solicitude by additional aids to this great and permanent interest; and in conclusion they suggest, that the condition of the cultivation of the earth may be assumed as a fair barometer of that of the state. When prosecuted successfully, peace and plenty prevail—when unsuccessfully, disastrous effects smite every portion of the social body. Nor should it escape the representatives of a free people, that it is the intelligent cultivator to whom liberty, in any crisis of difficulty, refers as her safest champion. All which is respectfully submitted.

ROTTEN LIMESTONE SOILS OF ALABAMA.

To the Editor of the Farmers' Register.

In my short communication found in the August number of the Register, (page 499,) I must explain what you have corrected. It was written n a moment of haste, and not sufficiently explicit. When I said that "to talk of any earth being amongst the *rotten limestone* would be absurd," he idea I intended to communicate was, that *the pile of rotten limestone was so far raised above the surrounding earth, that none could have been put amongst it*. It was a mass of *rotten limestone entirely*. Throughout this state, and equally throughout Georgia, where this matter abounds, few individuals can be persuaded to place any confidence n its valuable effects on vegetation, believing that t possesses no *nutritive qualities*. The facts presented appeared to me so evident a contradiction of this opinion, and such a positive proof that calcareous matter in some forms must in some way or other furnish a pabulum or food for plants that I viewed the facts as worth notice. The vegetaion of plants is not more rapid or luxuriant in the bottom lands of the Alabama or Tombigbee than on the *shell banks* beforementioned, and I cannot hink that the small proportion of alluvial soil could satisfactorily account for it, but that credit must be given to the calcareous matter for furnishng nutrition in some way or other. I would also emark that the vegetation in the heap of *rotten imestone* continues to grow with singular luxuiance, although we have had in this section of the tate for some time back a most destructive drought. *Cotton* is cutting short rapidly, on every kind of land except the rotten limestone or *cane brake* lands.

AGRICOLA.

Southern Alabama.

WATERING CATTLE IN WINTER.

From The Farmer's Cabinet.

Perhaps it would excite the surprise of many of ur readers, should we assert that cattle generally uffer more from thirst in winter, than during the eat of summer. Yet there is strong reason to beeve that this is to a great extent the case. Cate whose winter food consists entirely of hay, straw, nd other dry materials, need a plentiful and freuent supply of pure fresh water. This many do not obtain, as nearly all running streams are covered with ice, and cattle are obliged to wander a considerable distance from the yard to the watering place, through deep snows or over a slippery path, exposed to the annoyance of dogs, or to be gored by other cattle, and rather than endure this, they often suffer much from a want of water. It has been ascertained that a bullock, who has water at command, will drink it eight times a day. It should always therefore be of easy access to cattle at all times; and not on a distant part of the farm, or in the open road, so that in order that your cattle may help themselves to it, you are obliged to leave your gate open, or barn-yard bars down, and thus your yard is thronged with vagrant colts and other ill-bred animals, who take possession of whatever fodder they can lay their mouths upon, and pay no regard to the rights of *meum* and *tuum*. Dr. Anderson says that he knew a man who became very rich by being *great* in *little* matters, that is, attending carefully to things which other men consider of too little consequence to claim their notice; and this man always made it a point to see that his cattle, particularly his milch cows, should have a constant supply of pure water.

For the Farmers' Register.

ESSAY ON VEGETABLE PHYSIOLOGY.

By George D. Armstrong, Prof. of Nat. Philosophy, and Chemistry, in Washington College, Va.

[Continued from page 469, No. 8.]

Chap. XXI.

DISTRIBUTION OF PLANTS. EFFECT OF DIFFERENCES IN CLIMATE. EFFECT OF DIFFERENCES IN SOIL. BOTANIC NOMENCLATURE FOR SOILS.

In examining the vegetable covering which is every where spread over the surface of our earth, we cannot but notice the fact, that the plants of which it is composed differ much in different countries. This difference appears to result principally (if we leave out of account the influence of man) from two causes; viz., differences in climate and differences in soil.

Temperature has obviously a great influence on vegetation. It is a well known fact, that the plants of tropical countries, such as the tropical palms, cannot be made to flourish even in temperate regions, much less in those which border on the polar circles; and on the other hand, those which are indigenous to temperate climates, such as wheat and rye, will not flourish within the tropics. In considering the temperature of a country in relation to vegetation, we should attend not only to its mean temperature, but to the extremes of heat and cold to which it is subject, and also to the liability to sudden changes, more especially in the spring and fall; in the spring, because plants are then putting forth their leaves, and those organs are then peculiarly tender; in the autumn, because then plants are ripening their seed and are very easily injured.

The effect of differences in climate is not so great in the case of some plants as in that of others. The results of many observations respecting this matter are, 1st, endogens, such as the palms, which are destitute of a distinct bark, are much more sensibly affected by sudden changes of temperature than exogens, such as the oak; 2nd, plants of a dry nature, resist cold much better than such as are watery, and indeed all plants resist cold better in dry winters, than in moist ones; 3rd, as a general thing, trees which lose their leaves during the winter resist cold better than such as retain them, and of those which retain their leaves, resinous trees, better than those which are not so; 4th, herbs, the roots of which are perennial, all resist better than those whose stalks and leaves are persistent; 5th, annuals which flower late, and whose seed lie dormant in the soil till the succeeding spring, stand the winter better than those which flower early, and whose seed drop and germinate before winter.

The causes which have most influence in determining the climate of a country are, distance from the equator, elevation above the level of the sea, and the nature of the surface. Without entering into a philosophical examination of the manner in which climate is affected by each of these causes, it may be worth our while to attend to a few facts respecting the extent to which each of them does affect climate, in order to ascertain their effect on vegetation.

From a comparison of a great number of observations made by Humbolt and others, in different parts of the world, it appears that a difference in latitude of one degree, causes a difference in the mean temperature of 1° Fahr.; and that a difference in elevation above the level of the sea of 400 feet, produces about the same effect. "Mountains 1000 fathoms or 6394 English feet in height, in 46° north or south latitude, have the mean temperature of Lapland; mountains of the same height between the tropics enjoy the temperature of Sicily; and the lofty summits of the Andes, even where situated directly under the equator, are covered with snow as eternal as that of the north pole." "At the foot of Mount Ararat," says Tournaport, "I met with plants peculiar to Armenia; above these with plants which are common in France; at a still greater height I found myself surrounded with such as grow in Sweden; and at the summit with such as vegetate only in polar regions."

The nature of the surface of a country also affects its climate. The presence of high mountains always renders a country colder than it would otherwise be; proximity to the sea renders a country cooler in the summer and warmer in the winter; a country whose surface dips towards the south is much warmer than one in the same latitude whose surface dips towards the north. It is a fact which has long been known that countries in America and Asia, are much colder than those of Europe in the same latitude. American plants vegetating at 42° north latitude, will vegetate at 52° in Europe. The low temperature of America as compared with that of Europe, is owing principally to the existence of immense tracts of wood land and vast marshes in the former, which are entirely wanting in the latter. The low temperature of many parts of Asia is owing to their great elevation above the level of the sea; almost the whole of central Asia is described by travellers as a vast plane, elevated many hundred feet above the level of the sea. Africa is much hotter within the tropics, than the corresponding parts of South America, because in the latter the temperature is lowered by the presence of immense chains of mountains, whilst in the former it is increased by the hot and burning sands which cover so large a portion of its surface.

The influence of elevation upon the climate of a country, accounts for the great variety of plants which are found indigenous to mountain districts. It has been laid down as a botanical axiom, that the more diversified the surface of any country is, the greater will be the variety of plants found growing in it.

From the remarks which have been made respecting the influence of climate upon vegetation, it must not be inferred, that the same plants will always be found growing in countries which resemble each other in that respect; for whilst two countries may be equally well adapted to the growth of particular plants, there may be causes which will effectually prevent those which are natives of one country from becoming *spread throughout* the other. Of such a character are, the existence of sandy deserts, so extensive that seed cannot be carried across them by any natural means; seas so vast that seed cannot be drifted in safety from one shore to the other; and long and lofty chains of mountains. To these causes it is that we must trace the fact that countries resembling each other in climate and soil, do not always produce the same plants. "Thus in certain parts of North America, which closely resemble those of Europe, not a single European plant is to be found. The same remark will apply to New Holland, the Cape of Good Hope, Senegal, and other countries, as compared with other countries similarly situated as to their physical circumstances." The separation of Africa and South America, if they ever were united, Humbolt remarks, must have taken place "before the developement of organized beings, since scarcely a single plant of the one country is to be found in a wild state in the other."

The character of the soil as well as the nature of the climate, has a great influence in determining the habitation of plants. This may arise from several causes. Among the more important of these are: 1st. The fact that some plants require certain peculiar substances not common to all soils, in order to perfect their organic structures. Thus silex enters largely into the composition of the bark of the cane, and unless this substance be present in the soil, it will of course be impossible for that plant to perfect its stem; carbonate of soda is a necessary element in the salsola, and in no soil but one furnishing carbonate of soda can the salsola grow. 2nd. The peculiar texture of a soil depends very much, perhaps we might say, entirely, upon the nature of the substances of which it is composed. A silicious soil is always loose and porous, an argillaceous soil is always close and stiff. A loose porous soil it is evident is much better adapted to the healthy growth and rapid propagation of such plants as have large and fleshy roots, or as develope tubers or underground stems, than a close, and stiff one; so that if we should suppose that in the first place, one of this species of plants was equally diffused in all kinds of soil, the whole tendency in the one case would be to its rapid diffusion, whilst in the other case, it would be to its destruction. 3rd. The action of soil upon the excrementitious matter deposited by plants, will also affect their distribution. As has been remarked in a previous part of this essay, this excrementitious matter differs much in the case of different plants; in some cases possessing an alkaline, in others an acid character. If it be of an acid character, and the soil contains some salefiable base with which that acid may unite, and by which it may be neutralized, such for instance as lime, the action of the soil will be of such a nature as to favor the plant's growth and increase; but if on the other hand the soil already contain an acid, its action, or rather its want of action will be of such a nature as to result in the entire extirpation of the plant. In such ways as these, the nature of the soil, must always have great influence in determining the habitation of plants.

As a thorough knowledge of this matter will admit of some important practical applications, and as I am not aware that any extensive series of observations on this subject has ever been made in this country, I will give a list of those plants which are considered peculiar to particular soils in England, extracted from Loudon's Encyclopædia of Agriculture; substituting for the common English names, those which are common in this country, so far as they are known. Loudon's arrangement of soils is, as clayey, calcareous, sandy, feruginous, peaty, saline, moist or aquatic and dry.

1st. "An argillaceous or clayey soil may be distinguished in most parts of Europe by the growth of the following plants.

Tussilago farfara, (colts-foot.)
Thalictrum flavum, (yellow-flowered meadow rue.)
Potentilla anserina, (tansey chinquefoil.)
" argentea, (silver five-finger.)
Carex, (many species,) (sedge grass.)
Juncus, (many species,) (bullrush.)
Orobus tuberosus, (tuberous bitter-vetch.)
Lotus major, (no common name known.)
" corniculatus, "
Saponaria officinalis, (soap-wort bouncing-bet.)

Of these, the first mentioned, viz. the *Tussilago farfara*, is a certain and universal sign of an argillaceous soil, and is the chief plant found on the alluminous grounds of Brittain, France and Italy.

2nd. Plants indicative of a calcareous soil.

Veronica spicata, (spiked brook lime.)
Gallium pusillum, (little bed-straw.)
Comparula glomerata, (no common name known.)
Prismatocarpus hybridus, "
Phyteuma orbiculare, "
Verbascum lychnitis, (lychnitis mullein.)
Viburnum lantana, (hobble-bush.)
Berberis vulgaris, (barbeny.)
Helianthemum vulgare, (no common name known.)
Anemone pulsatilla, "
Clematis vitalba, (white-veined Virgins bower.)
Onobrychis sativa, (no common name known.)

Of these, the last mentioned is considered the surest indicator of a calcareous soil in England. The first mentioned, viz. the *Veronica spicata*, I am inclined to think is the *Marl Indicator*. At any rate, this much is certain; that the *V. spicata* is a species not described in any American botany to which I have had access, and the specific name *spicata*, would apply to the Marl Indicator, (judging from the engraving given in the Register,) as properly as to any other species of *Veronica;* and moreover the fact that the *V. spicata* indicates the presence of calcareous matter in the soil has been observed in Europe, and lately the same observation has been made respecting the Marl Indicator, which is ascertained to be a species of *Veronica*, in this country. From my own observation, I would place among the foremost in the list of plants indicating calcareous soil, one which Loudon has not mentioned, the *Lithospermum officimale*, (stone seed or Gromwell.) This is a plant very abundant in all the lime-stone portions of the valley, and I never have seen it but once in Eastern Virginia, and that was in the county of Prince Edward, on a narrow vein of a peculiar species of marl, the only calcareous soil in all that section of country. If it indicates the presence of calcareous matter in the soil, it will do so, not by growing in a stream which in some part of its course has flowed through a marl bed, but by growing on the very spot where the marl exists. The *L. officimale* grows to the height of from 6 to 12 inches, is a tough looking hairy plant, has its leaves situated in pairs on opposite sides of its stem, blossoms very early in the season, continues in blossom 5 or 6 weeks, and bears a bunch of cup-shaped flowers of a peculiar orange-yellow color. Later in the season, four hard shining black seeds may be found in the bottom of each of the persistent calices, and hence its common name of stone-seed. Whether it grows in all calcareous soils I cannot tell, but of this I am quite certain, that it grows in none but soils of that character.

3rd. Plants indicative of a silicious soil.

Veronica triphyllos, (three-leaved speedwell.)
" verna, (summer speedwell.)
Echium italicum, (no common name known.)
Herniaria glabra, "
" hirsuta, "
Silene anglica, (catch-fly.)
Arenaria rubra, (red sand-wort.)
Spergula arvensis, (corn spurry.)
Papaver hybridum, (hybrid poppy.)

Of these, the *Arenaria rubra*, is considered in Europe, the unfailing indicator of a poor sandy soil.

4th. Plants indicative of a ferruginous soil, *i. e.* a soil containing a large portion of oxide of iron.

Rumex acetosa, (horse sorrel.)
" acetosella, (sheep sorrel.)

5th. Plants indicative of a peaty soil.

Vaccinium myrtillus, (myrtle-leaved whortleberry.)
Vaccinium uliginosum, (winter-green whortleberry.)
Oxycoccus palustris, (craneberry or cranberry.)
Spergula subulata, (no common name known.)
Tormentilla officinalis, "

6th. Plants indicative of a saline soil.

Salicornia herbacea, (samphire, glasswort.)
Salsola kali, (saltwort.)
Zostera marina, (Sea-eel-grass.)
Pulmonaria maratima, (sea lungwort.)
Calystegia soldanella, (no common name known)
Illecebrum verticillatum, "
Sison verticillatum, "

Chenopodium maratimum, (salt lamb's quarter.)
Arenaria maratima, (salt sand-wort.)
Atriplex laciniata, (orache.)

7th. Plants indicative of an aquatic or marshy soil.

Caltha palustris, (American cowslip, marsh marygold.)
Hippuris vulgaris, (common mare's tail.)
Pinguicula vulgaris, (butterwort.)
Valeriara dioica, (wild valerian,)
Viola palustris, (marsh violet.)
Samolus valerandi, (brook-weed, water pimpernel.)
Lythrum salicaria, (milk willow-herb.)
Ranunculus lingua, (great spearwort.)
Epilobium tetragonum, (no common name known.)
Thysselium palustre, "
Lycopus europeus, "

8th. Plants indicative of a very dry soil.

Arenaria rubra, (red sandwort.)
Rumex acetosella, (sheep sorrel.)
Thymus serpillum, (mother of thyme.)
Trifolium arvense, (rabbit-foot clover.)
Acynos vulgaris, (no common name known.)

The above is a catalogue of those plants which are considered peculiar to certain kinds of soil in Europe. Some few of them are plants which have never as yet been discovered in this country, others are common here. That some of these plants do indicate peculiarities in the soil in which they grow, seems to have been noticed in very early times, long before botanists had attempted to assign any reason why it should be so, as we may learn from the common names which they bear, and by which they have been known for a time so long "that the memory of man runneth not to the contrary"—for instance. salt-wort, (wort is a word of Saxon origin, and means plant,) sand-wort, marygold, brook-lime, &c. There can be no doubt that these names have been given to them in consequence of their having been observed to grow in such situations as would be pointed out by their names.

A knowledge of the peculiar habits of plants in this respect, will admit of a practical application in two ways.

1st. If we know the nature of the soil which any plant naturally prefers, we may learn the character which we must give to the soil in which we wish to cultivate it, if we would cultivate it to the best advantage. Thus, the *asparagus* is a native of the saline lands along the sea-board, and naturally prefers a soil containing a large portion of salt. It is true that the asparagus will grow, and that to some degree of perfection in a soil containing little or no salt; but, at the same time, it is true, that nothing improves the growth and the flavor of that vegetable more than the free use of salt as a manure, on the ground in which it grows. Our best gardeners have long been aware of this fact, and are in the habit every spring of emptying the old brine from their meat barrels upon their asparagus beds. In no other way can we have a more striking illustration of the adaptation of different plants to different kinds of soil, than is afforded in the operation of brine when thus used; for whilst it will increase the luxuriance of the asparagus, it will kill almost every other plant which may be growing amongst it.

2nd. From a knowledge of the connexion which exists between certain plants and certain soils we may learn the character of any soil by observing the plants which voluntarily spring up and flourish upon it. Hence the use of the veronica spicata or marl indicator in pointing out the presence of calcareous matter in the soil in which it grows. The fact that soils may be distinguished in this way seems to have been noticed by practicable farmers for a long time if we may judge from some of the terms in common use for the purpose of designating soils; thus we speak of whortleberry swamps, cypress swamps, pine barrens, scrub-oak lands, chinquapin lands &c.—And why may not this system, suggested as it has been by the observation of practical men, be carried out, and the different kinds of soil be designated by the character of the vegetable covering which is naturally spread over them, as well as by the substances which enter into their composition; or by the mechanical texture of the soil itself. I would by no means banish from use a chemical or mechanical nomenclature of soils, but simply introduce, what may be called a botanical nomenclature to supply their deficiences. That our present *systems have* such deficiences every one must be aware. It is truly remarked in the 'Essay on Calcareous Manures' "that," nothing is more wanting in the science of agriculture, then a correct nomenclature of soils, by which the characters might be learned from the names, and nothing has hitherto seemed less attainable. The modes of classing and naming soils, used by scientific authors, are not only different and opposed to each other; but each of them is quite unfit to serve the purpose intended."

A system of nomenclature for soils, based upon the character of their natural vegetable productions, would seem to be a far more natural one for agricultural purposes, than one based upon their chemical composition or mechanical texture. The practical agriculturist wishes to know the nature of a soil, not for the purpose of using its elements for any chemical or mechanical operation, but in order that he may learn what will be its action on vegetation, and any information respecting its chemical or mechanical composition is of use, no further than as it throws light upon this matter. In the character of the plants which *spontaneously* spring up and thrive upon any portion of land, he has precisely this kind of information embodied in a palpable form by the hand of nature herself. I know that there are objections to this system, and not the least of these, is the uncertainty or entire want of common names for most plants, accompanied as it is with an utter want of a knowledge of systematic botany. But then there are still greater and more insuperable objections to any other system which has yet been proposed;—And perhaps, upon examination, the difficulty in the way of the adoption of a botanical nomenclature, will not be found to be so great as it would at first sight appear.

Among plants which might be used for this purpose are:

The Whortleberry—*Vaccineum*
Dewberry—*Rubus trivialis*
Mullein—*Verbascum thapsus*
Sorrel—*Rumex acetosa*
Pine—*Pinus*
Scrub-oak—*Quercus ilicifolia*
Broom grass—*Bromus pubescens*
Cypress—*Cupressus*

Rabbits food clover—*Trifolium arvense*
Marsh marygold—*Caltha palustre*
and many others which have definite common names, and common names which are the same in all parts of the country. In connexion with this subject however, I must remark, that all plants are not fitted for such a use. A very large class of plants seem to grow almost equally well in almost all kinds of soil. In noticing what is technically termed "habitat" of a plant botanists very frequently mention it as "omnibus locis," i.e. growing in all situation, to all appearance equally well. There is another class of plants, much less numerous than the first mentioned, which do not thrive except in peculiar soils;—these and these only could be used for the purpose of nomenclature.

Before any regular system of botanic nomenclature for soils could be adopted, it would be necessary that we should have a much more extensive and accurate series of observations than has ever yet been made;—And yet perhaps I may safely attempt a commencement, at least enough to shew what is meant. Drawing my information principally from the 'Essay on Calcareous Manures' I would say, broom-grass land i. e. land on which broom-grass voluntarily springs up and flourishes, is naturally unfit for the production of wheat or corn, in consequence of its incapacity to retain putrescent manures. This evil is best corrected by the application of calcareous manures.

Brook-lime land contains a large portion of calcareous matter, and is best improved by the immediate application of putrescent manures, without any preparatory application of lime or marl.

Rabbits-foot clover land is for the greater part of the year very dry, whatever may be its appearance at the time when examined, and on this account, though it may produce corn or wheat pretty well, should not be put in grass unless some artificial method of watering can be applied.

March-marygold land is for the greater part of the year partially covered with water; whatever may be its appearance at the time when examined, and is on this account unfit for the production of any grain or valuable grass unless first improved by draining.

These instances are sufficient to illustrate my meaning. If such a system could be adopted, it would possess at least this one advantage; that any farmer after having learned the names of a few plants, would be able to determine the character of the soil which he cultivated without the application of any chemical tests, or any other examination than such as could at once be made by the eye; moreover he would be able to understand and apply with certainty any information which he might obtain from the experience of others.

CHAP. XXII.

TERMINOLOGY OF BOTANY. SCIENTIFIC NAMES OF PLANTS, THEIR NATURE AND VALUE AS COMPARED WITH COMMON NAMES.

"In all the natural sciences it is necessary to express, with the greatest possible brevity and precision, a large number of ideas which are beyond the resources of ordinary language. In order that accuracy and uniformity may be attained in describing natural objects, and that the language of scientific writers may be exactly comprehended," we are compelled to resort to the use of technical terms. In adopting a technical terminology for a science, two different methods may be pursued. 1st. We may take those words in common use which approach nearest in meaning to that which is required, and giving to them a strict definition, use them afterwards in conformity with that definition. 2nd. We may invent new words, or adopt words from other languages. In every instance however we must define our terms, and never lose sight of those definitions. In forming the terminology of botany both of these methods have been pursued. Those common words which from their nature are definite is their signification, such as the numerals, the words opposite, alternate &c. have all been adopted without any modification of meaning, and on that account cannot properly be considered as technical terms. Other common words which have not a very acurately defined meaning, have been adopted after giving to them a technical definition. Of this character are the words, hairy, linear, lanceolate &c. Others again, have been taken from other languages; principally from the Latin, and in their adoption, respect has been had in every instance to their original meaning;—Of this character are the words cordate, reniform, auricular, nectary &c. Without going into an examination of the reasons why each of these methods has been adopted, or the extent to which each of them has been pursued, it will be sufficient to remark, that in these ways a terminology has been gradually formed for Botany, which whilst it presents but few real difficulties to the student, more especially to the student familiar with the latin language, it possesses all that acuracy and definiteness which are so essential to scientific language. It is true, that at the outset, the array of technical terms which meets the eye of the tyro in botany, may lead to the belief that in their acquisition he will have difficulties of no common magnitude to overcome, but if he will set about the work in earnest, he will soon find that these difficulties, like many others, "loom largest at a distance." There are not more than forty or fifty technical terms in very common use, and as for the others which occur only occasionally, their meaning can be learned from any botanical dictionary, when they are met with, and need not be placed as a burden on the memory.

Where we have to speak of so great a number of individual objects as are presented in the vegetable kingdom, it is necessary that we should have some name by which to designate, not each individual, but each species of individuals. These names must not be long, or they will prove very inconvenient in use; and yet they must be entirely distinct from each other, or they will lead to confusion, and in either case they will prove a very serious obstacle to the progress of science. The system of nomenclature now in use among botanists is one first proposed by Linnæus. "Linnæus proposed that the name of every plant should consist of two words; one designating its genus, the other its species. The first is termed the generic name, and is always a substantive; the second is the specific name, and is usually an adjective." At the same time that he proposed this system of nomenclature, he gave a number of rules to be observed in the application of these names, which have generally been attended to by succeeding botanists.

The most important of these rules are the following. 1st. Generic and specific names must be of Greek or Latin origin, and should always be written in Latin. This rule has not always been strictly observed. 2nd. The best generic names are those which indicate some obvious peculiarity of the genus; either as to the situation in which it grows, as *arenaria*, a plant that grows principally in sandy places; or such as mark the botanical characters, as *streptopus*, a plant the peduncles of which are bent in a remarkable manner, *hemianthus*, a plant whose corolla is apparently cleft or halved. 3rd. Genera may sometimes be dedicated to persons who have distinguished themselves in the science, thus, linnea, mecklenbergia, elliottia, &c. 4th. Specific names should be formed on similar principles with those of genera, only that more latitude is allowable in some respects. They should if possible be framed so as to express some distinguishing mark of a species, or some striking peculiarity in appearance, or to denote the peculiar situation in which the plant naturally grows. Viola *palmata*, and *pubescens* are examples of the first kind, *v. blanda* and *debilis* of the second, and *v. palustris* of the third. Comparative appellations may often be properly applied, such as *viola primulafolia, quercus olivaformis*, or to indicate a general resemblance, as *hypericum ascyroides, anemone thalictroides thalictrum anemonoides*. 5th. Specific names may be derived from the country the plant inhabits. Indeed a large portion of North American plants bear the name of Virginiana, Canadensis, or Americana. 6th. The names first published, whether of genera or species, are always to be adopted, even in preference to much better ones, unless the former are absolutely in contradiction to universally received rules. In framing new names it is desirable that the above rules of Linnæus should always be observed.

As many persons are disposed to undervalue the scientific nomenclature of plants, it may not be inappropriate in this place to make a remark or two respecting this matter. If we refuse to use these names, the only alternative which is left us, is to make use of what are called the common names of plants. To such a course there are several very serious objections. In the first place, the great majority of plants have no common names, at least such is the case in every part of our country. In Virginia, not one in a hundred among wild plants, has a common name by which it is generally known. Then in different parts of the country, the same plant is frequently known by different names, and what is still worse, different plants are frequently known by the same name. But even supposing that these difficulties were removed, and that we had a complete set of common English names for plants; those names would not be understood in France or Germany, and in each of these countries another set would be in common use which would be entirely unintelligible to us, so that the observations of the botanist or agriculturist of one country would of necessity be a sealed book to those of every other.

None of these objections will apply to the nomenclature in use among botanists. Names have been given to all known plants, and new plants as soon as discovered are named; these names are the same in every part of the world, and in no instance is the same name given to different plants. It is true that the learner meets with some difficulties in acquiring a knowledge of these names, but yet on the whole no greater difficulty than he would have to encounter in acquiring an equal number of what are called common names. At the present time, this nomenclature has been so long and so generally in use among botanists and scientific agriculturists, that any change, even if there were reasons for desiring a change, is entirely out of the question, and unless we will take the labor of mastering it, much of that which has been written both on botany and agriculture will remain forever beyond our reach. As an instance in point, I may mention the "account of a series of experiments on different grasses" given in the appendix to 'Davy's Agricultural Chemistry.' The information contained in that paper is of the very kind which it is most important, the practical agriculturist [whose attention is turned to the cultivation of grasses] should have. And yet without a knowledge of the botanical names of plants, it might almost as well be so many blank pages. It is true that the common English names are *given*, but unfortunately for us, the common names which are in use in this country are entirely different. To mention but one instance, and that of one of the most common and one of the most important of the grasses; the *phleum pratense*, the common name given in the paper referred to is meadow-cat's tail grass, and this no doubt is the common name in England. In some parts of the United States this grass is called timothy, in other parts it is called herds-grass; whilst the grass called herds-grass in the valley of Virginia is an entirely different grass. With this instance before us, we may see the true reason why the results of the experiments of different farmers, particularly of experiments upon the comparative value of the grasses, are so discordant. Different farmers have called the same grass by different names, or different grasses by the same name, and thus have been experimenting on very different things. In such circumstances it is no wonder that their conclusions are at variance with each other.

CHAP. XXIII.

SYSTEMATIC CLASSIFICATION OF PLANTS. ARTIFICIAL AND NATURAL SYSTEM. COMPARATIVE MERITS OF THE TWO.

Besides a scientific terminology and nomenclature for plants, a systematic classification of them is necessary, in order that our knowledge of their peculiarities in structure, in habit, or in use, may be presented in such a form as to be easily acquired or easily retained. When the simple fact is stated, that more than 80,000 species of plants are now known to botanists, this necessity will be at once apparent. The full exposition of systematic classification belongs properly to systematic botany, and not to vegetable physiology; but yet as I have had occasion frequently to refer to classes and orders of plants, in the preceding parts of this essay, I should feel that I was leaving my work incomplete, should I fail to give a brief sketch of the two systems of classification in common use at the present day.

These two systems are commonly distinguished as the artificial system and the natural one. The former is sometimes called the Linnæan system, from the name of its inventor, and sometimes also the sexual system, for a reason which will be apparent after examining it. This system is so exceedingly simple and easily understood, that it has, from the first, been deservedly popular with botanists, and has prevailed to the exclusion of all others. Soon after the different offices of the stamen and pistil had been ascertained, Linnæus conceived the plan of a classification of plants, founded upon peculiarities in these organs, in number, situation, connexion, &c. This he afterwards accomplished and presented to the world in his 'Species Plantarum.'

A good idea of this system will be obtained by examining the following synoptical view of it, extracted from Gray's Botany.

- Plants having
  - stamens and pistils manifest
    - both found in the same flower
      - stamens separate from the pistil.
        - unconnected with each other
          - of equal length
            - Stamens 1............Class 1st, Monandria,
            - " 2........................2nd, Diandria,
            - " 3........................3rd, Triandria,
            - " 4........................4th, Petrandria,
            - " 5........................5th, Pentandria,
            - " 6........................6th, Hexandria,
            - " 7........................7th, Heptandria.
            - " 8........................8th, Octandria,
            - " 9........................9th, Euneandria,
            - " 10......................10th, Decandria,
            - " 11 to 19...................11th, Dodecandria,
            - " 20 or more adhering to the calyx,............12th, Icosandria,
            - " 20 or more not adhering to the calyx,........13th Poliandria,
          - of unequal length,
            - 2 long and 2 short stamens..............14th, Diagnamia,
            - 4 long and 2 short stamens..............15th, Tetradynamia,
        - connected with each other
          - by their filaments in 1 set..........16th, Monadelphia,
          - by their filaments in 2 sets.........17th, Diadelphia,
          - by their filaments in more than 2 sets..........18th, Polyadelphia,
          - by their anthers..................19th, Syngenesia,
      - stamens adherent to the pistil..........................20th, Gynandria,
    - in separate flowers
      - on the same plant..........................21st, Monæcia,
      - on different plants..........................22d, Diæcia,
      - some flowers perfect, others separated on the same, or 2 or 3 different plants.....23rd, Pylygamia,
  - stamens and pistils concealed, or none..........................24th, Cryptogamia,

From an inspection of the foregoing synoptical view of Linnæus' system of classification, it will be seen that, the first eleven classes are characterized by the number of the stamens, those stamens being disconnected with each other, and of equal length; the two succeeding classes, viz. the 12th and 13 derive their characters from the number and insertion of the stamens; the next two classes, the 14th and 15th are based upon the number and relative length of the stamens; the next four classes, the 16th, 17th, 18th and 19th upon the connexion of the stamens with each other; the next class, viz. the 20th is founded on the adhesion of the stamens to the pistil; the next three classes, the 21st, 22nd and 23rd are characterized by the stamens and pistils growing in different flowers, either upon the same or upon different plants; and the remaining class, the 24th, includes all those plants whose flowers if they may be so called, have no evident stamens and pistils; of this character are the ferns, mosses, &c. In order to determine the Linnæan class of any plant, all that is necessary is simply to examine its stamens in the particulars referred to. The subdivision of these classes into orders is generally based upon some peculiarity in either the stamens or the pistils, characteristics taken from the stamens being used where they are not necessary in determining the class. There are however a few exceptions to this general rule; viz. the orders of the 14th class are based upon the presence or absence of covering to the seed, those of the 15th class upon the shape of the seed-pod, and those of the 24th class are truly natural orders, and ought not to be considered as properly parts of an artificial system.

"The object proposed by the natural system is to bring together in groups those plants which most resemble each other, not in a single character only, but in every essential point; so that a knowledge of any one individual of a group, will give an adequate idea of the structure, habits, and general properties of the whole. The subordinate groups being combined into larger assemblages, and these again into still more comprehensive divisions, the whole vegetable kingdom is at length embraced in the general classification. Thus, the genera are groups of kindred species, the orders are assemblages of kindred genera, the classes and subclasses are still larger assemblages, embracing orders, agreeing with each other in certain general and important particulars." In arranging plants according to such a system as this, it is necessary to pass in review every separate organ, and not to confine our attention to a single class of organs, as in the case of the Linnæan system; and besides this, we must determine respecting the relative value of the characters afforded by each class of organs; as a plant will be found to agree in some of its characters with one family of plants, and in others perhaps equally numerous, with an entirely different family. It is from this last mentioned source that the principal difficulties arise in giving to plants a natural arrangement.

And here, it may be worth our while to devote a little space to a brief examination of the relative importance of the different characters afforded by the different organs of plants, as it will give us, not only a fuller insight into the nature of the natural system, but also a better idea of what observation has taught the botanist, must be considered as permanent in the structure of a plant, and of course in what particulars it will be *impossible* by any artificial means to alter or improve it. And here, I shall draw my information principally from the chapter on classification in Gray's Elements of Botany, a work to which I have frequently had occasion to refer in the foregoing parts of this essay.

Every organic peculiarity in which plants differ or agree among themselves, is considered by the botanist as a character. In determining respecting the relative attention which should be paid to each, their permanence is one of the first things inquired into, those which are most permanent, being of the highest value; and those which are most variable, of the lowest. Thus the seed-vessel and the seed being produced year after year without any perceptible variation except in size, they furnish constant and permanent characters, but the color of the flowers, the surface of the leaves whether smooth or hairy, the height of the stem, &c., being liable to great changes, much less dependence can be placed upon them as distinctive characters. The highest *character presented* by any organ is drawn *from a consideration* of its *presence* or absence; thus the *two* great classes of flowering and flowerless plants are distinguished by the presence or absence of flowers. The characters next in importance are those furnished by the position or arrangement of any class of organs; thus the two great groups into which flowering plants are divided are distinguished by the arrangement of the cellular and vascular tissues; the first [exogenæ] having the vascular tissue arranged in concentric cylinders, around a common axis, the pith; and the second [endogenæ] having this tissue disposed in bundles and not in cylinders. Characters drawn from the form, connexion, relative length and relative number of organs, are next in importance, such as the number of stamens, pistils, seeds, &c. The abundance of any tissue, intensity of color or odor, the degree of pubescence, &c. are all characters of the lowest rank, being of themselves insufficient to distinguish species.

The *root* furnishes fewer characters than any other organ, the subterranean modifications of the stem, such as bulks, tubers, &c. are *of more importance*, but even as respects these, we often find plants which should evidently belong to the same natural family differing from each other.

The *stem* in its ordinary modifications, furnishes numerous characters of great importance. Its structure, whether exogenous or endogenous, distinguishes the two sub-classes of flowering plants from each other, as has been already remarked. The natural order of grasses are distinguished by having cylindrical and hollow stems, closed at the joints. Plants belonging to the natural order of labiatæ, which the garden sage *(salvia officinalis)* may be mentioned as an example, have *in almost* every instance square stems. All the plants of the Carolina allspice tribe (calycantheæ) have stems with four imperfect centres of growth, on the outside of the ordinary concentric circles of wood.

Leaves afford a great variety of characters of different degrees of importance. The outline or figure of leaves is much more variable, and of course, of much less importance than their arrangement on the stem. All Labiate plants have opposite leaves, whilst those of the ranunculus or butter-cup tribe have as constantly alternate leaves. As to connexion with the stem, it is observable that the leaves of endogens never separate by an articulation, but decay without falling; whilst a true joint is formed, sooner or later, in all exogenous plants. Characters of great importance are furnished by the manner in which the veins of leaves are arranged. Thus the gourd tribe exhibit the radiated form of veining, the amentaceæ [ex. oak] the feather-veined form, and the myrtle tribe is distinguished by the presence of an intra-marginal vein, formed by the confluence of the veinlets just within the margin.

Among the floral organs, the *pistil* affords more important characters than any other. Botanists always notice, whether this organ be inferior or superior, or, in other words, adherent to the calyx or free from such adhesion. Careful attention is also paid to the structure of this organ, particularly to the number of carpels of which it consists.

The *fruit* being the ripened pistil, the characters it affords are of nearly the same value as those of that organ, and several additional ones are afforded by the texture and dehiscence or indehiscence of the pericarp. The texture of the fruit rarely furnishes unexceptionable ordinal characters, since membranous, woody, fleshy and berry-like fruits are sometimes found in the same family, and even in the same genus; it however usually affords good generic characters, if we make allowance for occasional exceptions.

The *seed*, which unites in itself the characters of reproduction and of vegetation, affords more important characters than any other organ. The presence or absence of albumen is, with some qualifications, a most important character for distinguishing orders. The texture of the albumen, when this substance is present, is also taken into account. Thus it is oily in the poppy tribe, mealy in the buck-wheat tribe, in gramineæ, &c., horny in the umbellifera, and ruminated in the nutmeg tribe.

The *embryo*, or miniature plant contained within the seed, is found to afford characters of the highest importance. Its presence distinguishes flowering from flowerless plants; the want of one cotyledon distinguishes exogenous from endogenous plants; and its position with respect to the albumen distinguishes gramineæ from cyperaceæ. It is true that some of the characters afforded by the embryo are often minute and somewhat difficult of observation; but their constancy renders them extremely useful.

It is impossible for any one to become familiar with a large number of plants, and not group them together, in accordance with certain observed resemblances. Evidence that the mind naturally goes through with such an operation, is afforded in the names which are frequently given to wild plants; thus, there is a very common wild plant, called partridge pea; this name it doubtless received from a resemblance observed between it and the garden pea; but wherein does this resemblance consist? Perhaps few, whose attention has not been particularly drawn to this subject, could at once tell. They have observed a general resemblance, and there their observation has stopped. In this particular instance, the resemblance is not in the shape or texture of the leaves, nor in the general character of the stem, for in these particulars the two plants in question differ widely from each other, but in the form of the flower and in the character of their seed. The violet also resembles the garden pea in the general shape of its flower, and in its stem and leaves it is as much like that plant as the partridge pea is; and yet no one would think of classing the violet and pea in the same family, because its seed and seed vessel differ so much from those of the pea. It is the object of the botanist, in forming a natural classification of plants, to lay hold of these observed resemblances, inquire into their nature, and to arrange plants according to them.

"The object of the artificial method is merely to furnish the means of readily recognizing individuals, and arriving at their names; the natural method, with this object also in view, proposes moreover to arrange plants so that those most resembling each other in all important particulars shall stand side by side, and form groups by themselves; which groups are also to be arranged according to their mutual affinities into larger groups, and these again into still larger; all of which are to be disposed in the order of nature. This method accordingly, if perfectly carried out, must express both the near and remote relations established by nature between the individuals of the vegetable kingdom. An artificial method is easily contrived, as it may be founded on the diversities of form, &c., presented by one or two organs; its application requiring nothing more than a knowledge of structure sufficient for the observation of these diversities. On the other hand *the* natural method, (for there can be but one,) is not contrived, but discovered; and as it expresses the affinities and analogies imprinted by nature upon the members of the vegetable kingdom, it cannot be said to be wholly perfected until all existing plants are discovered, and properly described and arranged."

The principal advantage possessed by the Linnæan artificial system is its extreme simplicity, and the consequent ease with which it enables the tyro in botany to ascertain the name of any plant. But there are some very serious objections to this system. One is, that in many instances it widely separates kindred plants; and as frequently brings together, those wholly unlike each other in structure, appearance, properties, and indeed in every particular excepting the number and arrangement of their stamens and pistils. Thus whilst the mint balm, horehound, and the major part of the mint tribe, are placed in the class didynamia, sage, the water horehound, the horse mint &c, plants universally recognized as belonging to the same tribe, as their popular names denote, and agreeing with the others in every particular except in having but two stamens, are arranged in the class diandria. On the other hand, what resemblance can be traced between the lilly and the bullrush, the cucumber and the pine, except in the single particular of the number and arrangement of their stamens and pistils? A second objection is, that very perplexing difficulties often meet the student, arising from the irregularity in the number of stamens, styles &c. in the several species of a genus, or in different individuals of the same species, or sometimes even in different flowers of the same individual. Thus, the greater part of the species Stellaria have 10 stamens, and Linnæus accordingly placed the genus in the class decandria; but the common chickweed, [S media,] the species which of all others the student will probably first have occasion to examine, has usually five, often three, and very rarely as many as ten. This difficulty is not one of very uncommon occurrence, as will be evident from the fact that out of 274 genera, the whole number of common North American genera embraced in the first 10 classes of the artificial system, 78 genera contain species which are uniformly on commonly at variance with the class or order to which they are referred.

Neither of these objections can be urged against the natural method; it is the very object of that method to arrange plants according to their mutual affinities, and if in any instance plants which do not resemble each other have been placed together, in that particular there has been a departure from a strict natural method, and a departure too, which the future labors of the botanist will correct. The greatest objection to the natural system is its necessary complexity; and this is an objection which can by no possible means be removed. Yet the difficulty arising from this source is not as great as it is generally supposed to be. It must be confessed that where the object of the student is simply to learn the name of a plant, and where he has not much time to devote to botanical studies, the Linnæan system is to be preferred; but where it is his object to make the nature and structure of plants his study, to acquire an insight into the curious mechanism of vegetation, and he has time to devote to the study, the natural method is incomparably the best.

(To be continued)

ON MANURES.

From the Edinburgh Farmers' Magazine.

Sir,—The following remarks are on an important subject, and, if they can, with propriety, be inserted in your useful miscellany, I am convinced they will do some general good, both to agriculture and to the community at large.

No article in husbandry and gardening is of more consequence than manure. The labors of the cultivator and the researches of the naturalist, are more less advantageous to a district, according as abundant supplies of manure can or cannot be obtained. The sources whence this substance can be drawn are limited by nature, and by various circumstances. The chief supply is from cattle; but as it is impossible to maintain a quantity of these commensurate with the improvements by which husbandry could otherwise be advanced, manure is evidently a most important *desideratum* in every district.

The process of nature in preserving the balance betwixt animal and vegetable existences is wonderful. The former inhale the effluvia with grateful and salutary sensations which the latter throw off; and they derive health as well as nourishment from their productions. The latter receive their support and their salutary influence from the exuviæ of the former, and are more or less vigorous according as abundance of these are supplied. To both classes of existences it is an advantage to be relieved of their fruits; and to both, culture and cleanliness are peculiarly salutary.

But this invaluable species of manure is, to our fastidious sensations, so loathsome, that we as speedily as possible banish it from our sight. When men were scattered over extensive fields, this was natural and useful; but, when closely penned together in cities, the same art that preserves them there, and regulates the motion of all their natural propensities, must be exercised in relieving them from this disagreeable feeling. As things are managed in this and in most other large cities, human exuviæ are indeed put out of sight, but that is all; for nearly their whole substance is decomposed in the atmosphere which we breathe; and the remainder, after attaining its last degree of loathsomeness, is deliberately carried under our noses to that situation where alone it can be got quit of altogether.

From the process we observe going forward in the country, in church-yards and elsewhere, where putrid and fermenting substances are neutralized and absorbed without noisomeness and without difficulty, it is astonishing that a similar process should not have been instituted at home. Two things only are necessary,—to have no unnecessary mixture of fluidity, and to supersaturate the exuviæ with ashes, soil, or any carbonaceous matter.* The fluid part of exuviæ is known to be *invaluable in many manufactures*, and cannot be collected in sufficient quantities for their purposes. The sweepings of a house, and the ashes produced in the grate, might without any other assistance, supersaturate the rest. But for the attainment of health and cleanliness, no one surely will grudge (when it is necessary) the trouble of getting sand, or some such substance, to complete this supersaturation. Our artists now bend their genius to every improvement in every object. Can an article of furniture for accomplishing these objects, therefore, be considered as an extraordinary improvement?

To me it appears quite practicable to collect the whole exuviæ of this metropolis, amounting annually to some thousand tons, by such means as I shall suggest. The hand of the magistrate might here, as in most municipal improvements, be useful in the beginning, and in the superintendence of this matter; but individual interest would afterwards, I am persuaded, do the rest very fully.

I would propose to have from twelve to twenty public temples of Cloacina erected in convenient situations, and each under the superintendence of its owner or his lessee. I think these temples ought to be kept clean, by supersaturating and removing every thing of an opposite kind; that they ought to be neat and commodious; of a convenient form, and in such a position, that they should either be on a step, or be a half story up; that the reservoirs should be built round with ashlar, and floored, and have such an inclination of the sides as to make the bottom narrow, which bottom ought to incline towards the back, in which the door, or fixture by which the contents are to be removed, should be placed; and, the bottom being sufficiently raised above the ground below, the cart could be carried under it. A few motions with the shovel would by this means discharge the contents of of the reservoir into the cart, which would proceed through lanes and by-paths into the country.

In order to collect the whole exuviæ of a neighborhood, I would make this distribution a matter of labor and attention. Every morning at an early hour, let the proprietor of the ward reservoir, or his servant, go through and collect the domestic contents. Those ought to be collected in each house into a square box, with a lid, in a supersaturated state, which box the lessee would carry with him, leaving another for the use of the next day, with a quantity of saturating matter, as ashes, dried soil, &c. He might also collect the fluid exuviæ for the benefit of the manufacturers, in a separate jar; these boxes might be put upon his barrow below, by which he might carry them into the ward deposite, emptying each box therein by a side door, taking care, however, to supersaturate the whole.

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* Rich marl preferable by far.—Ed F. R.

As the sweepings of the streets and other rubbish might not be sufficient for all this supersaturation, the carts that carried off the rubbish might, in coming in from the country, bring a quantity of the matter necessary for this purpose, which could be distributed about the ward in the morning by the proprietor or his servant in the returned box. It would be proper to begin with carefully covering the bottom of the box. The top of the contents also, in like manner, should be covered with equal care.

The great difficulty to overcome is, to make this a work that persons can go about without difficulty or disgust. Nothing but supersaturation can prevent the last, and the due system of police the *first*, Penalities for throwing exuviæ out of the windows, and certain immunities secured to the proprietor or lessee of these temples, are necessary. But were the work once keenly set agoing, a variety of improvements might succeed; and the business, like many others of those that were from the first disagreeable, might be clothed with decency, and even, in course of time, with not unseemly flowers and ornaments.

I beg pardon for being so minute; but it is impossible to expect any advantage without this; for as people recoil from this subject as a thing unfit for notice, they must be convinced, not only of its expediency, but also of its practicability.

I shall conclude with just noticing that were the system, above recommended, adopted throughout the kingdom, many thousand acres of ground would be made of double their present value. Many thousand invaluable plants, now rare, would be produced in our gardens; the atmosphere of our towns and streets would be purified; and numbers of people not only supplied with labor, but with labor of the most productive kind to the kingdom.

GLAUCUS.

Edinburgh, 19. *May*, 1809.

ON HUMAN EXUVIÆ AND SOIL-HOLES.

From the Edinburgh Farmers' Magazine.

Sir,—In adding to the hints of your correspontden *Glaucus*, in last number, I do not think it necessary to follow him in his sort of half apology for commenting on stercoraceous subjects. It would be ridiculous to suppose that the readers of the Farmer's Magazine will regard any discussion as repulsive which is connected with the improvement of their art; and, in truth, none but the 'nasty ideas' of 'nice people' will ever find any thing repellent in discussions (with due periphrasis, to be sure) connected with the Cloacinean goddess. This letter then, sir, (not to offend your more squeamish readers with calling things by their right names), will treat of human *exuviæ* and *soil-holes*.

Ideas similar to those which have been urged by *Glaucus*, and by Dr. Hunter in one of your early volumes, relative to the importance of collecting these exuviæ more carefully, have often struck me. There can be little doubt that the annual *ejectamenta* of an individual, if properly applied to an acre of soil wanting manure, would enable it to produce a quarter more of grain of any kind, than without this application; but, to be within the mark, let us say one fourth of this, or two bushels; the value of which we will call ten shillings. The amount, then, to which, by this application, the national wealth may be reasonably supposed capable of being annually extended, is, in the whole empire, no less than eight millions of pounds. Now, what proportion of this manure may we conjecture to be at present profitably applied? In the country, doubtless, the greater part, and in many large towns a partial proportion. But, in some of our populous cities, there is reason to believe that nine tenths of this manure is utterly wasted. On the whole, it may be fairly assumed, that not more than one half is profitably applied. By this neglect, therefore, a national loss of four millions is anually sustained. Is it not worth while to inquire how this may be avoided, even though at the risk of turning the stomachs of some over nice readers?

The first question to be resolved, is, in what way are the human exuviæ of your great cities wasted? Generally, of course, by being conveyed into the common sewers, and from thence to fatten the *fuci* in the ocean, instead of augmenting the produce of our fields and pastures. The *bogs* of London seem commonly to communicate with the sewers: but I confess I was always puzzled to guess whither the pipes of the *water-closets*, now so frequent, are conveyed. I conclude however, to the same quarter. How is this waste to be remedied? The rich will doubtles continue their water-closets. If they communicate, therefore, with the sewers, their contents must be wasted. The *bogs* might perhaps be abolished, and more economical repositories be abolished, and more economical repositories provided. The mode may be best explained by detailing the practice in this respect at a neighboring town, where there are not, I venture to say, ten cart-loads of human exuviæ wasted in a twelvemonth.

In Hull, the place I allude to, every house is provided with a soil-hole. This is a *sine qua non* to the meanest tenement, and the very first *desideratum* that a builder considers essential. None of these communicate with the sewers. They are usually very small, and with but one seat; in the front of which is an opening, closed in common by a square board, which fits pretty accurately, and is fastened by two wooden buttons or nuts. The bottom is made to slant a little towards the back of the building; but is rarely more than a few inches below the floor. Into this seat all the ashes made by the family are constantly thrown. The consequence is, that the exuviæ are so completely neutralized that no offensive smell is felt, though they are often built close by the back-doors in very confined yards. The dustmen, as they are called, of whom many have accumulated considerable fortunes, send their carts and men every two or three days, to clean out these soil-holes. This is effected by merely opening the front board, and shovelling the contents into a tub, which is emptied into a cart. So completely is every thing fluid absorbed by the ashes, that no dirt is made by this process, nor is it at all offensive to pass one of these carts in the street:—you merely see what appears to be a load of ashes. This manure is eagerly bought by the adjoining farmers; and often shipped and sent up the rivers to a great distance. Of course, the price is high; and the dustmen consider it a *favor* to be allowed to clean out a soil-hole gratis. They never think of demanding money; and often, I believe, *give* a gratuity to the servants. How should they do otherwise, indeed, when they sell this manure for six and seven shillings a cart-load of about a ton? This price I paid some years ago for two lighters-full, the freight of which was as much more. Now, I believe, it is higher. As a proof of the value set upon manure at Hull, it may be stated, that the magistrates have more than once published threats of punishment to those who should secretly *sweep the streets*, to the injury of the scavengers who had contracted to clean them; and that there is quite a competition amongst children with wheel-barrows, and old men with carts and asses, who traverse the town, carefully sweeping up every heap of horse-dung casually dropped.

The general adoption, in large towns, of the practicable system above detailed, would fully answer the wishes of *Glaucus*; would create a vast annual accession of national wealth; and would supplant the '*ha'd your hand*' nuisances which are experienced in some places. Still, however, a vast quantity of valuable manure will always be conveyed to waste down the sewers of a large city. To turn this to account, the plan proposed by Dr. Hunter is very feasible. Let the outlets of such sewers be surrounded with reservoirs constantly furnished with a succession of absorbent materials, that would drink up the precious fluid as fast as it arrived. Nothing could make better manure than such a saturated mass.

BURYING BEES IN WINTER.

From the New England Farmer.

Our last swarm came off in June, and notwithstanding the old adage that "a swarm in June is not worth a spoon" we should refuse an offer of two spoons for this, and more, unless they were very nice and very heavy. True, the quantity of honey which they have gathered is not very great, but, with our way of managing such hives, we think amply sufficient for their supply. We propose burying them through the winter, a practice which we have adopted in two successive years, and had we continued it the third, our old colony, instead of coming to an utimely end, would probably have been in existence now through its descendants.

My method of burying bees is as follows. The operation is performed the last of November. The pit in which they are to be placed is dug considerably larger than the hives, in every respect. On the bottom of the pit two sticks say of scantling, four inches square, are so placed that a cavity may be left into which the water if there is any may settle, and run off without injury to the bees. On these blocks I lay my floor board, which should be *sound* and full an inch thick; if more, no matter. The top of the hive should be covered with a two inch plank, or if more convenient, a piece of wide thick slab with the rounding side up, so that if the frost comes out, and heavy rains fall, it may serve as a roof to carry the water from over the hive and turn it into the pit below. Straw is then placed as compactly as may be around the hive, and the earth thrown on so as to form a cone above it, which again operates as a roof to turn the water as it falls. With regard to the depth of burying, we can only say, that in our former experiments, we never sunk the top of the hive below the surface. Whether it would be well to do so we cannot say. Some, when burying their bees, drive down a stake near the hive, as they say to admit the air; but we do not see why a stake, drove with the earth compactly placed around it, can form an air hole more than the earth itself. And if it could, we do not see the necessity of it, for the object of burying bees is to put them as much as may be in a state of dormancy through the *winter*, by which their stock of provisions is lengthened out, to secure them from sudden and often fatal changes from heat and cold and from storms and sunshine.

In selecting a place for burying, it is important that a *dry* one should be chosen, and *we* prefer one that is cold to a warm one, and could we regulate the condition of the earth around them, we would freeze it the night after their burial, and *keep it frozen* until time for their exhumation in the spring.

We, in both instances of our former burying, took them up some of the last days of March, and as the dead we found from the four hives thus kept would not half fill a person's hand, and on exposure to the sun and atmosphere, the living were as bright and lively as though they had known no winter, and they gave swarms earlier and more frequently than did the hives that were not buried, the ensuing summer.

AN ENGLISH GRASS FARM.

From the New England Farmer.

Mr. Editor.—During my residence abroad, I spent one summer and a part of the autumn at Merton, in Surry, domiciled with a Mr. Raine, tenant to Mr. Middleton, author of the Agricultural Survey of Middlesex, with whom I was acquainted. It was a hay and grass farm, and the management of it was of the best description. It consisted of 160 acres, all improved as meadow, no plough being used on the place except in the garden. The course adopted was as follows.

Early in the spring the fields were all shut up. As soon as the hay was secured, and this was a great labor, the teams commenced carrying it to London for sale, *loading back with manure*. And now commenced that course of judicious conduct which excited my warmest admiration at the time, and has remained my beau ideal of good management ever since. The second growth of grass being well shot up, Mr. Raine went to the cattle fair, and bought large beeves, in high condition. In his rich and clean meadows, these were soon ready for Smithfield market, to which they were sent, and their place supplied by other beeves, still in high condition, but of much smaller size. On the removal to the shambles of the second herd, still smaller cattle, in fair condition, were bought, to be initiated into a still higher preparatory degree of fatting. These were sold off, and were succeeded by small lean cattle from the Welsh mountains, to be improved as stores. The fifth set of temporary tenants of the farm were small sheep, to be wintered.

The farm, as I have remarked, consisted of 160 acres. The rent paid was £2 10s per acre, at $4.80 the pound sterling, twelve dollars per acre, £1,920 for the farm. Paying this enormous rent,—saddled with heavy taxes, and at a large outlay for manure and farm servants, Mr. Raine was still accumulating large riches upon it. His house was in the style of a gentleman, and his expenditures on a most liberal scale, but he owed nobody a farthing. •

We are poor farmers in this country, Mr. Colman, very poor farmers, as Alfred Jingle would say, very. Those of us who do best, are very far from doing as English farmers do. They make more profit per acre from the *borders of their fields* than we make from our best intervale; realize as much gain in the shifting stock to consume the herbage of a single summer, as we do from growing for three years the same number of head. Every thing there is made to produce profit. As large a capital is invested as we invest in a thrifty commercial business. No man can rent a farm who has not a sufficient capital to stock it, work it, and lay out of the price of a year's harvest. The outlay of capital on a large farm is very great. A fair estimate of the required sum on a farm of a thousand acres, is five thousand pounds sterling. It would astonish the American farmer to see the book of "bills receivable and payable" of an English lessee of a farm. Yours,

J. A. I.

THE AGRICULTURAL STATE OF SCOTLAND.

From the Cultivator.

And what has that to do with American husbandry? it may be asked. Much, we reply. We may learn from what Scotland *was*, and what she *is* in agriculture, many useful lessons in farming. We may learn our own errors in practice; and, if we are not too proud, or too conceited, we may learn, from Scotch lessons in farming how to correct them —we may learn from them how to double at least, the products of our agricultural labor. The history of Scotch agriculture for the last fifty years, is invaluable to every farmer who would improve his practice. History is wisdom, teaching by example.

We find a valuable essay in the 'Edinburgh Quarterly Journal of Agriculture,' showing what Scotland *was*, and what she *is*, in regard to her agriculture. She was, in 1784, two years after the close of our revolution, "as poor as a *church mouse*." She is now, perhaps, the richest in agricultural products of any portion of Great Britain, at least so far as regards her arable lands. The writer describes the face of the country at the middle of the last century, as "no better than that of a bleak, howling wilderness," and well, he adds, might the poet at the inn window indite—

"Bleak are thy hills of north,
Not fertile are thy plains,
Bare-legged are thy nymphs,
And bare —— are thy swains."

"In 1784, a few gentlemen, full of zeal for their country, and it may be a little love of society, formed themselves into a sort of hole and corner club, in a coffee house called the Exchange, situated in the court of that name, near "the market cross of Edinburgh." Here, in the enjoyment of agreeable conversation and a good supper, did those worthies talk over plans for the amelioration of the high-lands, and from this nucleus arose the now widely extended and powerful Highland Society." * * "To say what was the state of agriculture in Scotland at the date of the formation of the Highland Society, would, to treat of it minutely, require greater scope than the limits of a periodical admit." "But to take one sweep over hill and dale, cornfield and meadow, we may at once pronounce the agriculture of Scotland, at that period, to have been wretched—execrably bad in all its localities! Hardly any wheat was attempted to be grown; oats full of thistles was the standard crop, and this was repeated on the greater part of the arable land, while it would produce twice the seed thrown into it: turnips, as part of the rotation of crops, were unknown; few potatoes were raised, and no grass seeds or clover were sown. The whole manure of the farm being put on a little bit of ground near the farmstead, and there they grew some barley of the coarse sort, termed *bere*, wherewith to make bannocks, broth and small beer, or peradventure, if the farm lay at the foot of the Grampians, to brew a portion of 'mountain dew!' Since the writer can recollect, a great part of the summer was employed in the now fertile shire of Fife, in pulling thistles out of the oats, and bringing them home for the horses, or mowing the rushes and other aquatic plants that grew on the bogs around the homestead. Such was the state of Scotland, with but little appearance of amendment, up to 1792."

The general outline of this picture of wretched husbandry is suited to the present condition of many districts on the eastern borders of our country, though the filling up of the picture would require to be somewhat different.

"Time, with her ceaseless wing, had now brought in another century, and on the arrival of the nineteenth, the richer part of the low country had put on another aspect. Beautiful fields of wheat were to be seen—drilled green crops and clean fallows every where abounded—the bogs had disappeared—the thistles no longer existed. In the Lothians, all this was carried on to a great extent. The farmers forgot themselves—they were coining money, and 'light come, light go,' was their motto. They went on in the most reckless manner—they began to keep greyhounds, to be members of coursing clubs, subscribed to the 'silver cup,' or 'puppy stakes,' and yelped the same note of folly as their betters in birth, their equals in extravagance and vice. Then followed yeomanry races—the good sturdy nag that would be of use *at a time* in the operations of the farm, was exchanged for a blood steed, and on market-day, instead of rational conversation about matters connected with their own calling, they began to talk '*knowingly*' about the turf. At this time, that is, from 1810 to 1814, the agricultural horizon was the brightest; the gas was fully up, the nation was alive; all was activity and business."

But at this time the battle of Waterloo came, and with it peace and low prices. Farmers could not sustain their extravagance—they had been unable to bear prosperity—and their farms fell into the hands of more prudent managers. We have seen much of the same routine of industry, extravagance and poverty, among the farmers of our own country. Not willing to 'let well enough alone,' they have embarked in speculation, or in pursuits to which they were strangers, and have gone into extravagancies and follies, to ape the great, which their means did not warrant, and which neither their comfort nor the welfare of their children required. The consequence often has been, that, like the indiscreet Scotch farmer, their lands have come into the possession of more prudent managers.

But though Scotch farmers failed, from not knowing how to bear prosperity, Scotch husbandry did not retrograde.

"In 1815, the turnip husbandry had got a firm hold in the country—the benefit accruing from it was so apparent, that no convulsion in the market prices could make the farmers forsake it."

Yet the culture was limited, owing first to the want of manure to feed the turnip crop, destined to fatten the farm stock; and secondly, to the expense of driving their cattle to a distant market. Two discoveries removed these impediments. The first, "the most important," says our author, "that ever occurred in the annals of agriculture, viz., that of *bone dust*," and the second, the *application of steam*, by our countryman, Fulton, to the propelling of vessels, which enabled the Scotch farmer to transport his fat animals to Smithfield market, at a moderate expense. "So palpable was the benefit to be derived from the use of bone manure, that in a few years there was not a farmer who did not avail himself of it. The farmers could now grow turnips to any extent, and the bare fallow was exploded." We have bone dust, and poudrette, and other newly discovered means of fertility, which the farmer is shy of buying and using. We have tried them all, and are satisfied both of their utility and the economy of their application, especially upon naturally dry or well drained soils. They add much to the products of agricultural labor, without any thing like a corresponding outlay. The Scotch farmer could now grow turnips to any extent. He could fatten upon these his stock, and he could send this stock to market at a trivial expense, for the "steam engine had become his drover."

But another—a third improvement followed, which we have yet to learn the value of—we mean *furrow draining* on flat and tenacious soils. Hear what our author says upon this subject:

"No man holding land ought to be ignorant of the thorough or Deanston drain. Mr. Smith, deeply engaged in the cotton spinning trade, could not procure a fall of water on the river Teith, ten miles west of the castle of Sterling, without renting along with it a considerable portion of very bad and wet land. Not liking to have a heavy rent to pay for such trash, Mr. Smith turned his powerful mind to the subject, and perceiving the folly of throwing away large sums of money on deep and useless drains, with all the stuff of tapping and boring, to *catch* the water, as if it were a wild beast for which gins and traps must be laid, hit on the idea of making drains in parallel lines in the hollow of every ridge, cutting them to the depth of thirty inches, filling them with small stones half way to the surface, above this putting a green turf reversed, and replacing the mould. Following up his first discovery by ploughing deep, he has now a farm of the finest land ever seen; and so convinced is the writer of the utility of this mode of draining, that each year he has been increasing the quantity he has made, and during the last twelve months has put in above thirteen miles. Nor is the Deanston drain confined to those parts of the country where stone or gravel can be procured: the same system can be and is followed with the same effect, by using the Marquis of Tweeddale's tile; or even the poorest farmer, who has not capital to undertake costly improvements, can fertilize his farm by making the thirty inch drains and filling them with brushwood. It is perfectly wonderful to behold the mighty change this thorough-drain system is making in the different parts of the country where it is in operation: wet land is made dry, poor *weeping* clays are converted into turnip soil, and even what would formerly have been accounted dry, is advanced in quality. Whole parishes in the vicinity of Stirling are completely transformed from unsightly marshes into beautiful and rich wheat fields, and where the plough could scarcely be driven for slush and water, we see heavy crops per acre and heavy weight per bushel, the quantity and quality alike improved." * * * * *

"It is the greatest quantity produced at the cheapest rate that will ever make a prosperous trade. If wheat is low in price, the farmer must bestir himself. Let him remember that if he can but grow one or two quarters more per acre, he will be in a better position, even with the low price, than he was before."

In speaking of the Highland Society, the writer enumerates the following means which that society adopted, as contributing largely to the mighty advance of the agriculture of Scotland:

"In the days of its youth and feebleness, the Highland Society sent the leaven of the turnip husbandry into all the glens and straths of the north, by offers of small prizes to certain Highland parishes; and the same may be said as to the growth of clover and the finer grasses. As it advanced in strength, (as to numbers and to cash,) attention was turned to premiums for stock; then came offers of reward to men of science to discover better implements and machines, to diminish friction and consequently draught, such as in the thrashing mill and other parts of agricultural machinery. Still advancing in the scale of intellect and of science, premiums were offered for essays to bring to light the facts connected with chemistry and natural philosophy; and, under the auspices of the society, was set up the 'Quarterly Journal of Agriculture,' a work which has been the vehicle of conveying so much useful information to the agriculturist, that we humbly venture to say it ought to appear on the table and book shelf of every farmer's parlor. After this, the great stock shows were resolved upon, as another link of union between the society and the practical farmer, at the same time throwing aside all paltry feeling, and making them open to stock from both sides of the Tweed, [i. e. from England as well as Scotland.] How well they have succeeded, let the last one at Glasgow bear witness. [This was the most splendid show of fine cattle ever exhibited.] Nor has the society forgotten the beauty of the country, as the premiums offered in regard to planting trees and such like subjects fully testify; and to sum up all, it may be said, the Highland Society has been a *point d' appui*, a rallying point, to which the agriculturists of Scotland might look, and a fostering mother to all who, although strong in talent, were weak in interest to make it public. An ardent lover of the plough and all that can speed it, the writer of this article would advise the society of England, and all other agricultural societies who would be useful to their country, to look into the annals of the Highland Society, and from them to cull whatever may be of use in the advancement of the delightful science, the culture of the fields.

"The men
Whom nature's works can charm, with God himself
Hold converse; grow familiar day by day
With his conceptions; act upon his plans,
And form to his the relish of their souls."

The Highland Society have this year offered prizes to the amount of $17,000, under the following classification:

Class I.—Agricultural machinery, 500 sovereigns and a gold and silver medal.

Class II.—Essays and reports on various subjects, embracing thirty-one subjects of high interest to the farmer, viz:

1. Geological surveys.
2. Reports on coal districts.
3. Mines and minerals.
4. Products of peat moss, &c.
5. Comparison between different kinds of manure in raising potatoes.
6. Extended application of water and other power to farm purposes.
7. Comparative efficacy of the two modes of thorough draining.
8. Reports on irrigation.
9. Forest planting.
10. Sheep pastures at high elevations.
11. Improved sheep salve.
12. On crossing the Cheviot with the New Leicester ram.
13. Cultivation of the recently introduced cereal and other grains.
14. Feeding farm horses on raw and prepared food.
15. Early rearing and fattening of lambs.
16. Insects injurious to agricultural plants.
17. Insects injurious to forest trees.
18. Comparative nutritive property of grasses.
19. Extirpating ferns from pastures.
20. Thorough-draining.
21. Subsoil ploughing of thorough-drained land.
22. Mole plough.
23. Experiments with manures.
23. Analysis of bone or rape dust.
25. On the effects of altitude on vegetation.
26. Feeding of cattle.
27. Forests of larch.
28. On raising improved varieties of grains.
29. Reports on improved rural economy abroad.
30. Honorary premium for reports on certain districts in Scotland.
31. Investigation of certain points connected with the science of agriculture, viz:

An essay or memoir explaining on scientific principles, the mode in which soil operates in producing or facilitating the germination and growth of vegetables.

An essay or memoir describing and proving, on scientific principles, what is the best admixture of the ordinary elements of soil, for promoting the germination and growth of particular vegetables.

An essay or memoir describing, on scientific principles, the mode in which lime operates in rendering the soil better adapted for the germination and growth of particular vegetables.

An essay or memoir explaining, on scientific principles, the effect of drainage in altering the constitution or qualities of the soil, and increasing its fertility.

An essay or memoir, showing the nature of the atmospheric influences on soil, in promoting its fertility, including the modification of these influences arising from heat and cold, dryness and moisture.

Class III.—Waste lands—their improvement by tillage.

Class IV.—Crops and culture.

Class V.—Pastures—their management.

Class VI.—Live stock—district competitors.

Class VII.—Products of live stock—butter and cheese.

Class VIII.—The best kept cottages and cottage gardens.

Class IX.—Woods and plantations.

Class X.—General show of live stock and agricultural meeting at Inverness.

Having shown, by our quotations, something of the vast extent of the recent improvements in the agriculture of Scotland, and the influence which its agricultural society has had in promoting these improvements, we have given the above sketch of their premiums, as indicating the means they have adopted, and are adopting, to bring about this great and salutary change—to show how vast a field they occupy, and the great bearing which science is made to have in the improvement of the soil, and in the operations of the farm.

OATS NOT AN EXHAUSTING CROP.

To the Editor of the Farmers' Register.

The injury done to the crops of wheat for the last four years by the chinch-bug makes it necessary that the attention of Virginia farmers should be directed to the growing of some crop as a substitute. Oats (all agree) are to be preferred to rye, being a spring crop, and on that account less liable to be destroyed by the chinch bug. But fears are entertained by many persons that oats exhaust land more than any other small grain. Now, sir, this is a mere prejudice, for no one can assign a good reason for the opinion. Taking a different view of the matter, and wishing to test its correctness by an experiment, I eight years ago determined to put a piece of land in oats every year during my life, or the land's. I sowed this devoted (as some of my neighbors thought) piece of land six years in succession in oats, and the seventh year (1838) thinking it a little too foul for oats, put it in corn. This year it was in wheat. I shall put it next year to its former occupation, and continue the crop of oats on it to the end of the chapter. If any injury has been done to this field, by the six years successive crops of oats, I have been unable to discover it, but on the contrary think the improvement evident. I should mention that the land was grazed during the interval of rest, which was very improper, and that it was never fallowed but in the spring. Hereafter it shall not be grazed, and the fallow will be made in the fall. Under this latter treatment I expect great improvement. A friend, T. T. G., tried the same experiment for four years, and the result satisfied him that the vulgar opinion was incorrect. But if oats did exhaust equally with wheat, (which I utterly deny,) fed on the plantation the quantity of manure would be very much increased, and at the end of five or six years larger crops of wheat would be made by applying it to that crop; for as to the notion that wheat straw is necessary to good compost, it is all humbug. I had as soon litter my farm pen from a pine thicket as from a straw stack. The corn made on the field in 1838, under the disadvantages of bug and season, was as good as the field usually brought before it was put in oats. As the signs of the times indicate that at a period not very remote eastern Virginia will find it necessary to raise her own meat, I hope to use this experiment to the increase of my stock for market.

Yours respectfully,
JOHN P. BOLLING.

Amelia, October 14th, 1839.

Amelia, October 15th, 1838.

I observed this experiment of Mr. Bolling's with some interest, having thought oats more injurious to land than any other crop. But the product of the field in corn and wheat, and its present appearance, have convinced me that I was mistaken. There is no doubt that a field not grazed, and fallowed in September, might be put in oats for any number of years, with slow but continued improvement. WM. PURYEAR.

From Low's Elements of Practical Agriculture.

MANAGEMENT OF GRASS LANDS.

1. *Forage.*

The produce of land which is designed for the feeding of animals may be consumed in three ways:—It may be eaten upon the ground where it grows; it may be cut down and given to animals while it is yet green, which is termed soiling; or it may be dried in order that it may be preserved, when it is termed hay.

The plants employed for these purposes are the different forage and herbage plants which have been enumerated, some of which are chiefly applicable to herbage, some to green or dried forage, and some to either of these purposes.

The clovers and similar leguminous plants mixed with grasses, may be applied alike to forage and to herbage. They form, what in common language are termed the artificial or cultivated grasses; and land, when producing them, is commonly said to be in grass.

The seeds of the grasses and leguminous plants are to be sown in spring, in the manner before described, upon the surface of ground sown with the cereal grasses. When the crop of corn had been sown in autumn, the seeds of the clovers and grasses are sown in spring amongst the growing crop, the harrows passing over the surface with a double turn. When the corn itself is sown in spring, the grass seeds are also sown, just before the last turn of the harrows, and then the roller is frequently employed to complete the process. The seeds are sown either by the hand, or by the broadcast sowing machine, which regulates better the quantity, and sows them with more regularity. Care must be taken that the seeds of the grasses be sound and of the proper kinds, and that those of the clovers be fresh and well ripened, which will be shown by the shining appearance of the seeds; and great care must be used that those of either kind be free from the seeds of weeds.

The proportion in which the different kinds of clovers and grasses may be sown together, is chiefly dependent upon the longer or shorter period for which the land is to remain in grass.

The seeds of the clovers and grasses may be sown in autumn as well as in spring, without any corn crop; and this practice has been recommended, in the case of laying down land to permanent grass, as being calculated to afford a quicker and better sward: and so indeed it may do; but then it is by the sacrifice of a crop of corn, which is too great to be disregarded in the practice of the farm. Cases may exist, in which the value of permanent herbage is so great, with relation to that of corn and other crops, that this sacrifice may be made; but, in the great majority of cases, the advantages to be derived from the practice will in nothing compensate the increased expenditure. There is no difficulty, under good management, of getting the seeds of grasses and clovers to vegetate under the shade of corn in sufficient quantity to stock the ground; and in the forming of a meadow, therefore, there can seldom be a reason for deviating from the simple and economical practice of sowing the seeds of the herbage and forage plants along with the crop of corn.

The seeds, when sown, quickly vegetate, the plants springing up under the shelter of the larger crop; and in autumn, when it is reaped, they will be seen to be covering the surface.

In autumn, the ground may be slightly pastured with sheep; but heavy cattle, which would injure the surface, should not be put upon it, and sheep only for a short time. During the period of winter, the land should remain untouched.

In the following season, the plants may be consumed in either of the three ways that have been mentioned:—

1st, They may be pastured with live-stock.

2d, They may be mown two or more times during the season for green forage, and the aftermath pastured.

3rd, They may be made into hay, and the aftermath pastured.

When they are to be employed in the first of these ways, namely, for herbage, they may be pastured either by sheep or the larger cattle. Sheep may be put upon them in April, while they are yet short; but cattle should not be put upon them till the plants afford a full bite, which will usually be in May.

There is no period in the growth of these plants at which they will afford so early and rich an herbage as in this, the second year after they are sown, or when, in the language of farmers, they are one-year-old-grass. They will feed the larger cattle perfectly. But it is to sheep that they are in a peculiar degree adapted; and, in the practice of the farm, the larger cattle are usually put upon the old grass, while the sheep are fed upon the young grass.

Whether in any case, a field of young grass shall be applied to herbage or forage, is dependent on considerations of expediency and profit. If there shall be stock upon a farm requiring good and early grass, it may be most advantageous to use the new grass for herbage; in certain cases it may be more advantageous to employ it in soiling; in others to convert it into hay; and in the practice of the farm a portion of it may be applied to all these purposes.

When the grasses and clovers, or any other forage plants, are to be used for soiling, they are mown with the scythe and led directly to a house or yard, and put into a crib or rack, the animals being at the same time well littered with straw, so as to be kept dry.

A field of young grass intended to be mown is managed thus:—When the land is sufficiently dry in spring, it is rolled so as to prepare the surface for the action of the scythe; and should any loose stones be upon the ground, they are gathered by the hand previous to rolling, and thrown into carts driven slowly along the ridges. Sometimes the ground may be too soft to bear the carts, and in this case the stones may be laid in little heaps in the furrows until it is convenient to remove them. These operations should take place in the end of March, or as early as possible in April.

In the northern parts of the country, it is usually the beginning of June before the process of mowing can be begun, but in the southern parts mowing may commence several weeks earlier. The field, or part of a field, reserved for the purpose, is then mown daily in such portions as are required for each day's feeding, and the forage given in its green and juicy state to the feeding animals. While the field, or portion of the field, is thus being gone over, a second crop will have been springing up. Beginning then with the part which had been first mown, the ground is again to be mown daily until it is passed over a second time. In this manner, two crops or cuttings will be obtained, and in favorable situations three. Should there be an interval between the cuttings, that is, should the second crop not be sufficiently ready after the field, or part of the field, has been passed over, then some food must be provided for the feeding animals in the mean time. The best provision in this case is the tare, which is one of the reasons for cultivating this plant on farms where soiling is practised.

The practice of soiling has certain advantages over the more common system of allowing the animals to find their own food in the fields. Their provender is brought to them, and none of it is wasted by their treading it down, while they are freed from that disturbance to which all animals are subject in summer and autumn from insects. It is found, accordingly, that the larger animals feed well under this system, and that a smaller space of ground will be sufficient for feeding an equal number.

As a country becomes rich, highly cultivated, and populous, soiling is the manner of feeding which will naturally prevail. Hence it is practised in this country in the neighborhood of cities where the land can be kept fertile; and it is the system adopted in some of the richer parts of Europe, and in an especial degree in the Netherlands, whence we have derived it.

But although soiling be the most profitable system of feeding where it can be adopted, yet in this country it is in many cases not practicable, and in certain cases not expedient.

The cases in which it is not practicable, are when land does not possess a sufficient degree of natural or acquired fertility to produce good and early crops of grass, or when sufficient straw to litter the animals during the period of feeding cannot be obtained. A large proportion of the land of this country will yield an adequate quantity of grass for herbage, but not sufficiently early and good for regular soiling.

The cases in which soiling is not expedient, although it may be practicable, are when the animals to be fed require exercise to keep them in health and in a growing state. Thus oxen are the better of moderate exercise in their first or second year. Young horses absolutely require it; and even milch cows, although they may be fed in the house or yard, maintain their health better in the fields. To the habits of the sheep, the confinement of the house or yard is entirely unsuited; and although in some parts of Europe the system of soiling sheep is practised, it ought to make no progress in a country abounding in pastures like Britain. A case in which soiling may be applied in all arable farms in this country is that of feeding the working cattle of the farm.

The next and most common method of applying the sown grasses and clovers is as dried forage or hay, in which state they can be preserved and given to the stock in winter, or at other times.

When the sown grasses and clovers are intended for hay, the land is to be cleared of stones and rolled in spring, as in the case of green forage. And when the plants are in full flower, but before the seeds are ripe, or even before the flowers of the clovers have in any degree begun to fade, the crop is to be mown.

The plants, by the action of the scythe, are laid in swathes, with their heads lying pretty regulaly in one direction. The swathes lie for a short time to wither; and are then turned gently over by a fork, or the handle of the hay-rake, in such a manner that they shall not be broken and spread abroad. In 24 hours or more afterwards, they may be put into small heaps or cocks on every third or fifth ridge, according to the bulk of the crop, the ground being at the same time carefully raked.

It is a good practice to put up the hay green in these first cocks, and then to enlarge them by adding two together. If at this early stage they undergo a degree of incipient fermentation, it is no matter. It is in the later stages of the process that heating or fermentation becomes hurtful.

When the hay has become dry in the cocks, the period of which will depend upon the weather, they are made into ricks in the fields. The cocks are dragged together by a horse with a rope, one end of which is attached to one of his traces, and the other end being put round the base of the cock is fixed, to his traces on the other side. He is then made to pull forward the cock to the place required; and in this manner two or more of them be dragged forward at once, The ricks are made by a person standing upon them to build and compress them. They are formed with a conical top, and are each bound down with a rope made of the hay itself. In this state they may resist a considerable fall of rain; but the hay is not to be suffered to remain longer in the ricks than is necessary to dry it in a sufficient degree to fit it for being stored in a larger stack. When the hay is sufficiently ready, which will be denoted by its feeling dry when the hand is thrust into the rick, it is carried in a large sparred cart to the place where the hay-stack is to be formed, which is most conveniently, in the barn-yard, near the stables.

The hay-stack may be built in a circular or oblong form; the latter is the most convenient when the quantity of hay is large. A number of persons being placed on the stack to build, the hay is forked up to to them, and the stack, by the treading of their feet upon it, is compressed in proportion as it is raised. In 24 hours it will have considerably subsided, and in a day, or two afterwards it is thatched with straw, and bound down with straw ropes; the loose hay of the exterior having been pulled carefully out all around, so that the whole shall present a neat appearance.

Hay, when put into a large mass of this kind, will undergo a slight degree of heat; but, in the case of the clovers, and grasses, the slighter the degree of heat at this period the better, and hence the necessity of a previous preparation of the material as careful as the state of the weather will allow.

Often great difficulty is experienced in the processes of the hay harvest by the wetness of the weather. In such a case the farmer is obliged to watch the intervals of favorable weather, and employ every practicable means to forward the operations and secure the crop.

Some recommend the strewing of salt upon the hay, as the building of the stack proceeds. This corrects the tendency to fermentation, and renders injured hay palatable to stock.

In the making of hay, the great end to be aimed at is to prepare it as quickly as possible, and with as little exposure to the weather, and as little waste of the natural juices, as circumstances will allow. When we are enabled to do this, the hay will be sweet, fragrant, and of a greenish colour.

It is not usual to cut more than one crop of hay from the same ground in the year, although the second crop of the grasses and clovers may also be made into hay. It is never, however, so good as the first crop in weight and quality; and, besides, the late period of the season renders the preparation of it difficult or precarious. For these reasons the proper system is to pasture the aftermath, and not to make it into hay.

Wherever the system of the cultivated grasses is perfectly understood they will never be mown for hay more than once. The first year's aftermath, and all the subsequent years' grass, so long as the land remains untilled, are to be used for herbage alone.

The produce of hay varies greatly with the quality of the soil and state of the season. About 2 tons per acre may be regarded as a good crop, but often the produce is greatly more, and then the crop is considerd to be a great one. Hay, in the field rick, weighs somewhat better than 112 lb. per cubic yard; after being compressed in the stack it weighs from 140 to 160 lb., and when old about 200 lb.

Clovers, besides being raised for pasture or soiling, are sometimes culuvated for their seeds. In this case the clover to be cultivated should be sown by itself, pastured with sheep till pretty late in May and then allowed to grow and ripen its seeds. When the seeds are fully ripened, the crop is cut down, and formed into very small cocks, which after being, thoroughly dried, are lead home, and put into stacks until thrashed. The process of thrashing is a somewhat troublesome one, from the difficulty of separating the seeds from the capsules. It is usually done by the flail; and the seeds may be winnowed in the same manner as grain, but with sieves adapted to the purpose. This species of cultivation, however, has narrow limits in this country. The crop is a great exhauster of the soil, and, from the late period of ripening and the extreme dryness to which the plants must be brought, it is a somewhat precarious crop, even in the more favorably situated parts of the island. For these reasons the great part of the clover seeds consumed in this country is imported.

The grasses too, are frequently cultivated for their seeds. In this case the particular grass to be cultivated should be sown by itself. It should be dried and stacked like a crop of corn, and thrashed and winnowed. When the crop of this kind is cultivated, it should be regarded as an exhausting crop, and the land treated as if it had borne a crop of corn.

Sometimes the seeds of rye-grass are procured by a more partial process. The hay being put into cocks in the usual manner, it is thrashed just before being but into the larger ricks. The thrashing is performed in the field on a moveable floor of boards, placed upon a coarse convass cloth. In this case the hay should be slightly beaten by the flail, so as to detach the best ripened seeds without too greatly injuring or breaking the stems. The seeds are then but into sacks, and carried to the granary, on the floor of which they are spread and turned over as occasion requires. When dry, they may be dressed; or they may remain mixed with the chaff till spring. The hay, however, is always injured where this system is practised, both because it is deprived of the seeds, and because it is necessary to allow the plants to stand for a longer time to ripen than would otherwise be required.

No method of producing hay has been found comparable to that of the cultivated grasses. Under this system, the forage-plants are cut when in their state of most luxuriant growth, and no manure is laid upon the surface in order to produce the hay; the manures being applied to the preparatory fallow or green crops, in which case they are covered by the plough and rendered entirely available. Yet over the greater part of England, land is kept permanently in grass for the purpose of mowing it, manure being applied from time to time to the surface. This system has become the very habit of the country, and, by the general adoption of it, beyond a question a vast public loss is sustained. The practice of the cultivated meadows was probably introduced into England by the Romans, and at a long subsequent period was made more fully known by the Flemings; and yet by far the greater part of all the hay produced in this island is derived from perennial meadows, and thus an expensive method of production substituted over a whole country for one more cheap and efficient. Certain peculiarities in the state of property in England, the effect of tithes, and the relative expense of keeping land in tillage and under grass, seem to have contributed to this so general substitute of the natural for the cultivated meadow. From habit too, a preference is given to the hay thus produced. It is supposed by many to be more suited to keep horses in wind; and it may be so in the case of horses put to great speed, as the hunter and the race-horse; but, for the mere purpose of feeding, it cannot be doubted that the produce of the cultivated meadow, consisting of the superior grasses and clovers alone, in their young and most juicy state, must be greatly superior to that of the older grasses, mixed as they always are with a class of inferior plants. But if the large application of capital and the waste of land, for the production of this species of food, are to be regretted, in no other country are the farmers so diligent and so experienced in the management of the hay itself as in England.

The grasses to be mown are ready in the month of July, and they are cut down when the greater number of them have come into flower. When the land is of good natural quality, or when a ready command of manure exists, it may be mown every year for hay. But it is more common to mow it every alternate year, or every third or fourth year, according to its quality. It is then pastured in the intervening years, and in this way it is less exhausted than when mown every year.

Land subjected to this species of culture requires to be manured at intervals upon the surface. When it is mown every year, the manures should be repeated every second or third year; but when it is occasionally pastured, the manuring may be less frequent.

The manures used may be of all the kinds applied to land in tillage. That most commonly employed in practice is the common manure of the farm-yard, well rotted. This is spread thinly and regularly over the surface, generally at the rate of 7 or 8 tons to the acre. The period of laying it on is various; some preferring to spread it in October, others after the hay is cut in July or August, and some in spring.

The grass, when mown, is soon afterwards edded, or spread abroad with a fork, so as to be xposed to the sun and air. It may be turned over one or more times, and while yet green put nto little cocks. The manner of collecting the grass together is by raking it into rows, technically ermed wind-rows, the hay-makers in bands folowing each other with rakes until they have thus collected the whole into rows. They are then easily able, by hand labor, to form it into the small cocks described.

These first cocks are afterwards to be spread abroad, and, being exposed for a time, formed into arger cocks, termed sometimes bastard-cocks. In he county of Middlesex, where extreme attention s paid to the appearance and quality of this species of crop, the bastard-cocks are again spread abroad, and formed into yet larger cocks; after which they are led home, sometimes on the fourth or fifth day. The object of this repeated spreadng abroad, and forming into cocks, is to secure he hay in the shortest time, and with the least waste of its natural juices. This indeed is aimed at in all cases of making hay, but the details of practice are modified by the state of the weather, and vary in different parts of the country. Sometimes, to economise labor in these operations, hay-tedding and hay-raking machines are employed.

Although raising of hay on the natural meadow must be regarded as expensive, when compared with the raising of it on the cultivated meadow, yet there are soils and situations to which the practice is entirely suited, and in which it is the best means at the command of the farmer of obtaining dry forage.

One of these is the case of marshes, swamps, or bogs, producing naturally rushes, sedges, and the larger grasses. These marshes are of every degree of natural fertility, sometimes producing chiefly the *Carices* and *Junci*, and at other times producing the grasses of wet ground, as the *Poa aquatica*, *Poa fluitans*, *Agrostis alba*, and other plants of marshes.

The lowest for the most part in the scale of fertility of these wet grounds and yet of great importance in the elevated districts where they abound, are those which consist of a thick bed of peaty matter. These are usually termed bogs, and the produce consists chiefly of rushes, as the sharp-flowered jointed rush, and others. This species of hay is greatly less nutritive than that of cultivated or finer natural grasses. It is generally regarded as a little superior to the straw of wheat, barley, or oats, and will for the most part bear cutting but once in the year. It is too coarse for sheep, but is adapted to the winter provender of cattle. To these it affords a valuable resource in all the more elevated pasture districts of this country.

As the soil of the marsh improves, so for the most part does the natural produce which it yields. In flat and alluvial tracts the hay of the marsh is often valuable, even where cultivated forage can be otherwise obtained. It is frequently, therefore, a question of expediency, whether a marsh shall be broken up for tillage or allowed to yield its natural plants. It may produce a great deal of manure without requiring any; it may furnish a valuable resource to wintering stock; and it may not be capable of being fitted for cultivation but by a considerable expenditure of capital.

The manner of preparing the hay of marshes, is similar to that of preparing the hay of the grasses already described, except that greatly less nicety is required. The rushes or grasses, after lying for 48 hours or more, should be tedded well, so as to receive the influence of the sun and air. After this operation, which is usually repeated once or oftener, the hay should be put into small cocks, and, when sufficiently dried, put into ricks, to remain in them till the danger of fermentation is removed, when it may be led home and formed into a stack. A slight fermentation in the stack may take place without injury, but care must be taken that this be not carried so far as to injure the hay.

There is another case in which perennial grass land, though not marshy, may be beneficially employed to produce hay. This is in elevated pasture districts, where cultivated forage cannot be obtained. In such situations, hay must be procured for the stock during falls of snow, and then the only means of obtaining it may be to set apart a portion of the herbage-land for mowing. This is a case produced by the peculiar circumstances of sheep farms; and it does not invalidate the general principle, that hay is best produced on the cultivated meadow.

One other method, indeed, of producing natural hay free from all objection on account of the waste of manures, is yet to be considered. This is irrigation; but irrigation applies to the production of herbage as well as dry forage, and we may therefore first consider the management of land in the state of perrennial herbage.

(To be Continued.)

BENEFIT OF LIMING, AND GREEN MANURING WITH PEAS.

To the Editor of the Farmers' Register.

Beaufort co., N. C., Oct. 11, 1839.

I learn by your communication to me some time since, that it is your wish that I should let you know my plan of liming, and also that I would communicate the same for the Register. I would cheerfully do so, but that I am a plain, and fain would be a practical farmer, and have never written any thing of the kind. But, however, for the sake of being of any benefit to agriculture, if any benefit may be derived from the few hints that I may advance, I will now attempt to comply as far as my feeble efforts are capable of doing.

When I took possession of my farm, I found it in a very poor and worn out state, so much so that I became almost discouraged, and would have emigrated to some other one, had I the means to have done so without making a sacrifice; and not willing for that, I came to the conclusion that I would remain where I was, and see what I could do by way of improving my poor and worn out land, which I commenced by raking and scraping all the manure I could fall in with; and coming across a treatise in some one of your volumes upon liming, I fell upon that to see what I could do with it. The first part or cut of my field that I commenced liming, was of a kind of stiff and sour soil, subject to almost (I may say) every kind of insect; and it was with great difficulty I could get corn to stand on it. But as soon as I commenced liming I found that there was a great difference in the nature of the soil as well as the quantity of the grain, which induced me to procure all the shells I could get, and put them upon my land; and I can now say that I have improved my land, from liming and other manures, of which lime is the prominent part, from 25 to 50 per cent. My plan is to burn the shells just so that they will crumble.

I prefer putting them out on the land in the spring, say the last of March upon land that I intend putting in corn; spreading the lime broadcast; and about the last of June, or by the first of July, I sow the same land in peas, which is the last working I give my corn. As soon as the corn will do, I take the fodder off. As soon as that is got through with, I proceed to weed all down between the rows, peas and every other vegetation, which as soon as done, I proceed to gather the corn and sow wheat upon the same, taking care to run a furrow each side of the ridge in the row with a single horse plough before sowing, so as to cover the ridge up as near as possible; the balance of the row I break up with the same plough. But before I sow my wheat I soak the quantity I want for seed in strong lime water, say 24 to 36 hours; after which I strain it through a basket or colander, and as soon as that is done, I roll it in slacked lime until every grain is perfectly saturated with lime, so that it parts, in which state I let it go to the ground, taking care that the seedsman uses a little grease of some kind on his hands to prevent the lime from injuring them. This process I think, and am certain, is a preventive from the smut; and putting it on limed land I think is an obstruction against the rust, or at least I have not been troubled with either since I tried the soaking and liming. The quantity of lime I generally put on my land is from 40 to 50 bushels to the acre, afterwards sowing down in peas as above stated; and I can say this year that I never was more gratified; for I never saw a more flourishing crop of wheat on the ground in all my life, (and my neighbors certified to what I now say,) for I raised 25 bushels to the one sowed; and I had the same piece of ground in wheat three years ago, and I am certain I did not raise ten to one. I am now preparing the same land, and am in hopes to be able to have it ready by next week; and if the season suits, I am certain to get thirty for one, as I shall *have* my *land* in better order; besides I have another coat of manure upon it.

I have tried the cuttings (or slips) of Irish potatoes which I saw in one of your numbers, and find that good ones can be raised from the tops. I cut a few this summer after they had got up about a foot high, and planted them crosswise of a small ridge I had made for the purpose, and they were almost as large as those I planted, which I obtained from the north.

A FRIEND TO AGRICULTURE.

THE MORUS MULTICAULIS MARKET.

If we could still believe printed and apparently fair statements, we might now copy reports of large sales at high prices, made at the north since our last publication, and thereby exhibit indications, (which could not be doubted, if they stood alone,) of a continuing high market value. But we do not quote any such, because we have no confidence in them. Though we have heretofore warned the public of the tricks and falsehoods used to raise prices, we were ourselves to some extent deceived by them; and thereby induced to believe that there was more solidity and permanence in the early prices of this summer than has since appeared. But *if prices* were before raised by the tricks and deceptions of some speculators above their intrinsic worth, they have been more lately sunk as much below that worth, by the tricks and deceptions of others having a contrary interest. So it is, that the market is now flat—the factitious appreciation and speculative value at an end, for the present time at *least*—and the trees should now be held at their intrinsic value, for propagation and *for feeding silk-worms*—and for that legitimate use, they are worth much more than ten cents, at which price they have been lately sold in Richmond. Now is the time for holders of the trees to provide for their use, by commencing and effecting the establishment of cocooneries; and now also is the time for all who desire to commence that business, to buy their stocks of trees on the best terms. The depression of the price of trees furnishes no argument against the profit of rearing silk-worms; but, on the contrary, offers a great additional facility, and another element of profit. Let but every present planting in Virginia be put next season to this use, *in proper manner*, and we venture to predict that no cultivator will have cause to repent his outlay for the culture either of the trees or of their product in silk.

CULTURE OF RUTA BAGA.

From the Farmers' Monthly Visitor.

Dear Sir—Believing ruta baga to be of great value to the stock farmers, and as the season for sowing is at hand, I send you an extract from my farm journal, relative to my mode of culture the first year, though, as it was my first experiment, I am far from thinking it to be the best mode. However, as I was pretty accurate in detail, its publication may be of use to my brother farmers, by inducing some one better acquainted with its culture than myself, to point out the errors in my process.

In the fall of 1836, I broke up three acres of green sward; the soil a stiff loam, upon which I carted 150 single loads of coarse manure, and in 1837, planted with potatoes, there being nothing peculiar in the management, or extraordinary in the crop.

In the spring of 1838, I carted on sixty loads of well rotted manure, which I ploughed in, so soon as the ground was sufficiently dry, and on the 27th of May I again ploughed, harrowed, and after rolling smooth, marked it into squares of eighteen inches, and planted by dropping two or three seeds in each intersection, which was done by shaking the seed from a box, with a single hole in the top. I sowed from the 1st to the 4th of June; on the 23d began to weed, thinning out where the plants were too crowded, and setting out where deficient, which I continued to do occasionally when other work did not press, till the 28th July. On the 26th October, I began to pull and cut, finishing on the 9th of November; and I found the plants last pulled as uninjured as the first, although they had been exposed to several severe frosts. They were pulled by hand, the workmen striking two plants together to shake off the dirt, and then throwing them down, where they lay spread for three hours to dry the loose dirt that still adhered to them; the tops were then twisted off, and the plants thrown into heaps for carting, so that each root was handled three several times. They might have been got into the cart with less labor, but my object was to get them into the cellar in a tolerably clean state. Having heard much of the difficulty of keeping them in cellars, from their tendency to rot, I stored in one cellar, 1,500 bushels without injury to a single root, and I have now, (May 5,) more than 100 bushels as full and as fair as when first placed there. The cellar was thirty feet square, on the bottom of which, eight inch timbers were placed, and covered with plank two inches apart. The whole was divided into two bins, with one foot space between the bins, and one foot between the bins and the cellar wall; the sides of the bins being made with narrow boards, with a space of four inches between each board.

I fed out my twelve hundred bushels to my sheep, six hundred to my horned cattle, and the remainder to my horses. They all ate with avidity, preferring them to potatoes. For my horses and cattle they were merely cut with a spade; for the sheep, they were passed through a vegetable cutter. They were carted in two carts, each containing thirty baskets holding more than a bushel, and weighing seventy-four pounds. The number of baskets was twenty-one hundred, and the whole weight *seventy-seven tons*. Number of roots, 36,000—as put in the extract from my journal alluded to above. I am, sir, very respectfully, your ob't servant,

LEONARD JARVIS.

Ruta Baga,		*Dr.*
To interest on three acres, at $100 per acre,		$18
Twice ploughing three acres,		6
Harrowing and rolling,		4
Seed,		2
To 180 days' work on above, viz. 9 days, sowing, 85 weeding, hoeing and setting, and 36 drying and cutting—180 days, or, five months, at $13 per month,		65
To 22 weeks' board, at 9s. per week,		33
Cr.		$128
By 2100 bushels at 10 cents,	$210	
Profit, estimating at 10 cents,		82
Claremont May 5, 1839.		$210

Remarks.—Compared with the price of other crops, this ruta-baga was richly worth twenty cents the bushel; say it was worth only fifteen cents, the net profits on these three acres of ground were *one hundred and eighty-seven dollars.*

We are highly pleased to exhibit this evidence from one of the first, and we believe the most extensive practical farmers in the state of New Hampshire, in favor of the root culture. He shows by this experiment what much manure will do for a succession of years: it gives double payment in a single year for the labor bestowed; and this double payment will extend itself into a series of from four to ten years, according to the capacity for retention of the soil to which it is applied.

MONTHLY COMMERCIAL REPORT.

For the Farmers' Register.

The distempered state of affairs which has prevailed since the resumption of specie payments fourteen months ago, is succeeded by a second suspension in Pennsylvania and the states south of it. In this instance Philadelphia took the lead, and the first movement is ascribed to the United States Bank—now a state institution, with very extensive privileges, very extensively exercised.

The example set in Philadelphia, and followed up in Maryland and Columbia, was very reluctantly adopted by the banks in Virginia, whose operations have been conducted with much prudence; but as a constant drain of specie has been made from them which could not be reclaimed from the suspended banks, self-preservation rendered it necessary to check it. However early a period of resumption may be proposed, Virginia will be ready to assent to it. The banks north and east of Philadelphia, with the exception of those in Rhode Island, have not suspended, and the circulation of the city banks is so small that they may be able to continue specie payments. The pressure on their mercantile communities is however very severe, and the most enormous rates of interest are submitted to—from 2 to 4 per cent. per month. It cannot be otherwise than that many failures must occur, and that an entire derangement prevails in commercial affairs. The difference of exchange between New York and the cities south of her is 7 to 12 per cent. In New York the rate of exchange on London is 8 to 9, while in Philadelphia, Baltimore, and Virginia, it is 18 to 20 per cent. premium.

The banks in Virginia are constantly diminishing their circulation, consequently there is an insufficiency of money for the transaction of business. The result of which must be low prices, when produce shall be freely brought to market.

Very little of the new crops of cotton and tobacco has yet appeared, and prices are not established. The first sales of cotton were at 12½ to 12¾ cents, and recently at 11 to 12 cents.

The weather in England to 20th September was unfavorable for the wheat harvest, and shipments of flour to some extent are now going forward from this country. Wheat has consequently risen about 25 cents per bushel, say $1.25 to $1.30; and flour to $6¼ to 6½, in New York $6. X.

October 26, 1839.

SILK MANUFACTURING.

From the Genesee Farmer.

One great reason why we have such an unshaken confidence in the ability of this country to enter successfully into the culture of silk, its manufacture as well as its production, is found in the superior enterprise, industry and ingenuity of our citizens over those of any part of the world. Great Britain thought to prevent the establishment of the cotton manufacture in this and other countries, by prohibiting, under severe penalties, the exportation of machinery, or patterns for its construction. New England machinists went to work, built shops, made their own patterns, and produced specimens of machinery so much superior in action and principle to European models, that we at once obtained the preference in their own market, and now annually export large quantities of machinery to order. So it is already with machinery for the manufacture of silk. In reeling, and now in weaving the narrow kinds of silk, such as laces, ribbons, and other goods of that description, we have already made great advances on the clumsy and ill-arranged implements of the old world.

In the manufacture of ribbons, which forms so important a branch of the Lyons, or French silk manufacture, the foreign workman uses a narrow loom, resembling the common hand loom in other respects, and weaving but one piece of ribbon at a time. A machine, called in France a Jacquard, is attached to this narrow loom, and regulates the pattern of the ribbon, flowers, &c.—These looms are worked by girls, and these delicate and beautiful fabrics are the result of their labors. A Jacquard was brought to New York, and fell under the notice of Mr. Bergen, an ingenious mechanic, and member of the Legislature. Mr. Bergen instantly saw that great improvements might be made in the machine and loom, and immediately constructed one which is worked by power instead of the hand, makes seven pieces of ribbon or lace, where only one was made in the French loom, and gives the figure, color, or pattern with equal exactness and greater rapidity. In this single improvement of the ribbon loom, then, five or six sevenths of the labor required abroad is wholly dispensed with, and articles of any pattern can at once be furnished. In very narrow patterns, from ten to fifteen pieces can be woven at once. Such improvements at the outset leave no room for doubt, but that when the attention of our artizans shall be directed to the manufacture of silk machinery, we shall soon find our improved processes amply to compensate for any supposed difference in the prices of labor.

DEATH OF JUDGE BUEL.

From the Cheraw Gazette.

Judge Buel, the able and distinguished editor of the Albany Cultivator is dead. On his way to New Haven, Conn. whither he was going to address an agricultural meeting, he was arrested on the 6th. inst. at Danbury, by sickness, which in eight or ten days proved fatal. There are hundreds of men in the land whose names are better known to the great mass of even intelligent agriculturists, who have been more bespattered with fulsome praise by a frothy public press, and *whose* death would be much more extensively *deplored*; but we are sure we do not say too much when we say there lives not a *politician* who, during his whole life, has done the tenth part of the tithe as much towards advancing the true prosperity of the country as Judge Buel did during the half dozen years he conducted the Cultivator.

TO SUBSCRIBERS.

To give abundant notice and time from action, the "Conditions" of publication for the next and succeeding volumes of the Farmers' Register are published in this number. It is earnestly requested of all subscribers to read them, and observe the new facilities offered; and of those who may not intend to continue their subscription, either on the former and general, or the new and contingent terms, it is also requested that they will at least make known their discontinuance in rightful and proper manner, and as early as may be convenient. It is very important to the interest of the publisher to know as early as possible the changes to be made on his list, both by withdrawals, and new subscriptions added.

The reduction of price in consideration of prompt and advanced as well as combined payments, and of additional subscriptions furnished, has worked so well, that the regulation will be made permanent, and each subscriber, for the next and for each succeeding volume, may obtain a like reduction, by his *annually renewed compliance* with the like or other requisitions.

From all recent subscribers who have been brought upon the list under the new conditions, and also the old subscribers who aided their admission, we especially beg attention to the following remarks.

Under the new conditions for this volume, the two classes of subscribers named (being all who have chosen to avail of the offer,) have received their copies of vol. 7, for the net payment to the publisher of $5 for two volumes; or, on the general average, at half the regular price for each individual subscriber. But each one of these subscribers, after his payment is made, stands precisely upon the same ground, and under the same terms of agreement for the future, as all other subscribers heretofore, or as do all others who have *not* made use of the privileges offered. That is, each of these subscribers, like all others who have paid their dues, is perfectly free to discontinue his subscription *before* the commencement of the next volume; if not thus discontinuing, each will have the privilege of obtaining an extra copy of the next volume, for a *new* name and subscription, in the same manner as was done for this volume; and thus every one, by using the means proposed in each successive year, may continue to obtain his own volume every year at half price. Or, by an additional privilege now offered and made permanent, every person, or club, sending $25 in advance, and before February 1st of each year, may thereby pay for and receive 10 copies of that volume, whether for old or for new subscribers. Therefore, the mere forming and keeping up a club of any ten or more names, will put the work to all, for such prompt and joint payments, at half price. But every one on the list who does not take either of these steps, within the several limits of time allowed, will be bound for his subscription at the regular and full price of $5 the volume.

It is true, and no less obvious, that the main inducement to offer to supply two copies for the price of one, was the expectation that most of those who thus first became readers, would appreciate the value, and continue to be afterwards supporters of the publication. But we make no claim to continued subscription on that score. If, however, each one of our subscribers would each year take the little trouble necessary to send a new name, and thus obtain the copies at half price for both—and if, with this, every subscriber who desires to discontinue the work, would give proper notice, and in due time, the publication could well bear all such withdrawals, and would be all that could be reasonably desired on the score of profit to the publisher, and, at the same time, of cheapness to the subscribers. It would lead to this state of things—a sufficiently large number of subscribers, all paying punctually in advance, and the work furnished to all for half price.

The results sought to be obtained by these offers would be no less beneficial to the subscribers than to the publisher; and therefore, independent of all public and patriotic considerations, they are required by self-interest to lend their hearty aid. The publisher therefore presumes to ask that this aid may be given, for the benefit of the givers, and of the country at large. He has no right to expect that any thing should be done merely to aid his own private interest or gain. If but a slight effort were made by every subscriber, the effect of the general action would be to make the Farmers' Register one of the cheapest works of its kind; and if the still more valued and needed aid of the pens of its readers were given as freely as it should be, the value and usefulness of the work would be increased still more than its cost would be lessened. There is not one individual who may read these lines, who cannot forward one or both of these most desirable results.

SUSPENSION OF PAYMENTS BY THE BANKS.

While this great public calamity continues, one of our heretofore existing conditions must also, of necessity, be suspended—that which requires payment from subscribers in notes of, or checks on, "*specie-paying*" banks. In addition to our sharing, with the community at large, this general calamity, our publication must suffer heavy additional loss in discount upon the payments of remote debtors. But we have no choice but to submit; and will receive in payment the *current notes* of any *city* banks, of the state in which the debtor resides. North Carolina notes (which are at par in Petersburg,) or notes of any bank in Virginia, will be greatly preferred. Even these are now depreciated here 10 per cent. and more southern notes from 10 to 20 below them, or from 20 to 30 per cent. below specie. Such a state of things is alone sufficient to break down a periodical having very wide and scattered cultivation; and we despair of any *bona fide* resumption of specie payments by the banks, or of their ever being able to maintain a paper currency *truly convertible into specie.*

CONDITIONS OF THE FARMERS' REGISTER,

For the eighth and subsequent volumes. Prices still more reduced, for combined and punctual or advanced payments.

Art. I. The Farmers' Register is published in monthly numbers, of 64 large octavo pages each, at $5 a year, payable in advance. Or, for $5 may be had *two copies* of the same current or forthcoming volume, for *new subscribers,* if so ordered and paid for in advance, (or at the time of making the subscription,) in current money, as described below, (Art. VI.) and without loss or deduction for postage, or any other charge to the publisher.

II. Subscribers who may have already paid the regular subscription price of $5 in the manner above required, for a single copy, shall have the privilege, upon sending a *post-paid* order, of having a second copy of the same volume sent to any NEW subscriber, without further charge, for that volume, if so ordered during its time of publication.

III. A like privilege will be allowed to every old subscriber who has not paid, but who shall do so, as above, before the issue of the 6th number of the then current volume, (at which time of all debtors' bills will be made out and sent); thus in effect REDUCING TO HALF PRICE THE COST OF THE WORK TO EVERY SUBSCRIBER, OLD OR NEW, WHO MAY CHOOSE TO AVAIL OF THE OFFER. (See also Art. V.)

IV. If, however, no more than one copy is ordered, the subscription price will still be, as heretofore, $5 the volume; as it is not designed to permit any subscription debt, or payment, to be made for less than $5. And if an order is sent for two copies, without full compliance with the conditions annexed, (in Art. VI,) only one will be sent.

V. Clubs of ten subscribers (old or new, or of both) by sending $25 (net payment) in advance and at one time, before February 1st, of each year, shall be furnished with ten copies of that volume only.

VI. The price of back volumes, as heretofore, is $5 for one alone, $10 for any three together, and in the same proportion ($3.34 cents each,) for any number of volumes short of a full set. Entire sets of 8 vols. (the 8th commencing January 31st, 1840,) will be supplied for $20, or $2.50 the volume, paid in advance, with the order.

VII. ALL MAIL PAYMENTS MUST BE MADE IN NOTES, OR CHECKS, OF PAR VALUE IN VIRGINIA, or of a CITY bank of the state in which the subscriber resides. And all letters to the editor in regard to the Farmers' Register must be post-paid—except such as contain articles for publication.

VIII. The risk of loss of payments for subscriptions sent free of postage, which have been properly committed to the mail or to the hands of a post-master, is assumed by the editor.

IX. For all copies not received by mail, at the proper post offices, duplicates will be furnished to those subscribers *who have complied with their* own *obligations*; provided that the failure *shall be notified through the postmaster*, and *within one month after the date of the miscarried copy*.

X. If a subscription is not directed to be discontinued before the first number of the next volume has been published, it will be taken as a continuance for another year. Subscriptions must commence with the beginning of some one volume, and will not be taken for less than a year's publication.

XI. The mutual obligations of the publisher and subscriber, for the year, are fully incurred as soon as the first number of the volume is issued; and after that time, no discontinuance of a subscription will be permitted. Nor will a subscription be discontinued for any earlier notice, while any thing thereon remains due, unless at the option of the editor, (or in obedience to the regulations of the Editorial Convention.)

Petersburg Va., November [illegible].

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CLAIRMOUNT NURSERY,

Near Baltimore.

The subscriber has for sale at moderate rates a large stock of the MORUS MULTICAULIS MULBERRY TREES AND CUTTINGS, which are warranted to be genuine, being raised by him from a stock he has been raising from for seven years. Purchasers may rely on getting a good article, and carefully packed, so as to go safely to any part of the union. The above would be sold much lower deliverable during the autumn.

Also a general assortment of all the most rare and choice grafted fruit trees, especially 20,000 PEACH TREES and shrubberies. Ornamental trees and shrubs; Evergreen trees, grape vines and cuttings, superb roses, &c. See printed and priced Catalogues, which will be sent gratis by mail.

☞ Orders will be carefully executed by being forwarded to me by mail, or left with DUNLOP, ROSSER & JONES, Druggists, Petersburg, Va. and WILSON & SON, Norfolk, Va. who act as Agents and will receive orders at Nursery prices and furnish Catalogues as above.

ROBERT SINCLAIR, Sen.

August [illegible]—[illegible]

PIANOS.

Why go to New York to purchase a Piano, when you can do as well or better in Petersburg, Va.?

The subscriber believes that a majority of those persons would do better to purchase their Pianos in Petersburg than to send to New York for them. Here I keep constantly on hand from fifteen to twenty well selected new Piano Instruments, and, as no one store in Norfolk, Richmond, Baltimore, Philadelphia, or New York will be found at one time more than half that quantity [illegible] I hold out the greater inducement; and as respects prices, it will be found, by reference to several letters which I have published from gentlemen who are in the habit of visiting the North twice a year, that I have sold them on at least as good terms as they were offered elsewhere. In fact, I believe that a great many persons pay a great deal more at the North for a pretty looking but indifferent instrument, than they would in this place for a beautiful fine toned one, because they have not the same advantage in buying a single instrument that others have who purchase fifty or sixty a year, whose custom is retained by being supplied with the very finest instruments and upon the very best terms. Besides these advantages, those who purchase Pianos from me save half the trouble and risk that they would be bound to have in purchasing at the North. If an individual purchases a Piano of me, and by accident it should turn out badly, (which thing I am pleased to say has never yet happened, although I have sold nearly one hundred and sixty Pianos,) I am ready either to exchange or take it back. This I [illegible].

Those who want really fine Pianos shall not be disappointed, if they favor me with their orders, either to make choice myself for them, or have it done by some one else.

E. P. NASH.

Book and Piano Forte Store, Petersburg, Va.

Oct. 29.—tf

VOL. I. OF FARMERS' REGISTER.

The reprinting of Vol. I. of Farmers' Register is so far completed that copies will very soon be ready for delivery. Those persons who have already ordered and paid in advance for copies, will be supplied in a few days.

[illegible]

JUST PUBLISHED

And for sale at the Office of the Farmers' Register, Petersburg, Va. (the second American from the 6th English edition) of

DAVY'S AGRICULTURAL CHEMISTRY.

The text of the last English edition is precisely that of the edition of 1827, which received the last improvements and alterations made by its illustrious author; and the notes added to this text, are from the pen of its editor, Dr. John Davy, the author's brother.

No American edition of this valuable work has been published from any later than the first English; and even of these early and imperfect editions, few if any copies can now be found for sale. The work, in booksellers' phrase, has long been "out of print," and there are very few works that so well deserve to be reprinted, or are more essential to the library of every intelligent agriculturist.

In addition to the peculiar value possessed by this edition, as the latest and most perfect, it will be by far the cheapest yet published. By adopting the cheap form of the "Farmer's Register," "Essay on Calcareous Manures," and "Johnstone's Treatise on Draining, &c." the forthcoming edition of the "Elements of Agricultural Chemistry" can be furnished at one-fourth the cost of the earlier editions heretofore published in this country—and still lower compared to the latest English edition, of which this will be a full reprint.

The work well deserves, for its subject and intrinsic value, to be adopted as a text book in all schools of scientific and high grades of moral instruction; and the low price, this edition, and other agricultural publications from the same establishment, might be economically and profitably adopted, as merely reading books in primary or common schools.

Price 75 cents the single copy, or $5 for 8 copies. The work will be sent by mail, or otherwise, for any cash payments and post-paid orders.

BERKSHIRE PIGS.

Farmers wishing to obtain the genuine breed of Berkshire pigs, can be supplied by applying to the subscriber near Manchester. They are from the stock imported by N. C. Bement, Esq., of Albany, in the years 1834 and 1835. Applicants will pay their postage.

L. BURFOOT.

October 12th, 1839—a4t

MORUS

MULTICAULIS TREES

For sale.—10,000 to 20,000 trees from cuttings, planted 1st February last. They are in rows 3 feet apart, and 18 inches from tree to tree. Being planted so wide, and having had careful cultivation, they are now uncommonly fine, most of the trees being from 7 to 10 feet high, and so filled with branches as to completely shut up the 3 feet alleys, presenting to the eye, a field of the richest vegetation. Apply to

JOHN MILNE.

[illegible] P. O., Oct. 10th, 1839.—a3t

OSAGE ORANGE TREES.

I have two hundred plants of the Maclura or Osage Orange, from three to five feet high, which I will sell, deliverable next winter, at one dollar per pair, (male and female.) In a few years they will bear fruit abundantly. Orders may be left with the Editor of the Farmers' Register, or forwarded direct to

THOMAS S. PLEASANTS,

P. M. Beaverdam, Va.

FORWARDING
By the Richmond & Petersburg
RAIL-ROAD.

Goods sent by this Railroad will, if so directed be forwarded to any point on the line of the Petersburg and Roanoke, or Raleigh and Gaston Railroads, and goods sent by those roads to Richmond, will be received from the depot in Petersburg and brought on. The depot agent at Pocahontas, will attend to the forwarding, but this company will not be liable for accidents or losses, except as at present on its own road. The freight and passage through, on goods sent from Richmond must be paid there in advance, and on goods sent to Richmond may be paid either here or in Petersburg. A forwarding commission of 10 per cent. on the freight of this road must be paid to the agent, which will be received with the freight and drayage.

Goods will, in like manner, be forwarded to, or received from any point on the line of the Richmond, Fredericksburg and Potomac or Loui railroads, under the care of the freight agent Richmond.

Richmond, Feb 1.—a. tf

TO PLANTERS,
On and near the Appomattox,

FORWARDING BY THE
Richmond and Petersburg
RAIL-ROAD.

Produce sent down the Appomattox, will, if so directed, be forwarded by this Rail-Road to Richmond. The Depot Agent at Pocahontas, (Mr. Squires,) will attend to the forwarding from the Basin in Petersburg, and pay the drayage. The Company will not be liable for accidents or losses, except as at present, on its own road. A forwarding commission of 10 per cent. on the freight of this road will be charged by the Agent, and received with the freight and drayage.

Produce sent to be forwarded, should be accompanied by a letter from the owner to the Agent, to be delivered by the boatman at the Depot in Pocahontas immediately on his arrival.

☞ Freight on tobacco $1 per hogshead, on wheat 6 cents a bushel.

Richmond, June 30, 1839.—a&atf

AN OVERSEER

Is wanted for the Coggin's Point farm (Prince George county) for next year. None need apply except such as have the proper qualifications; and no regard will be paid to any merely *general* (or circular) recommendations.

Also, will be received on the same farm, if offered, one or more boys, of suitable abilities, and from 16 to 20 years old, as agricultural apprentices. They will be employed as sub-managers, each having charge of some particular department of labor. Apply to the Editor of the Farmers' Register, Petersburg, Va., or to

EDMUND RUFFIN, Jr.,
Oct. 31. (P. O. Garysville, Prince George.)

MULTICAULIS, ALPINE, AND OTHER MULBERRIES.

Wm. Prince and Sons, proprietors of the Linnæan Nurseries, near New York, are ready to receive orders to any extent for all the varieties of Mulberries, including the Chinese Multicaulis, American Multicaulis raised from Seeds, and very hardy, Expansa, Elata, Alpine, Canton, Brussa, Rose of Lombardy, Dandolo, Pyramidalis, &c., the six first named of which, surpass all others and are placed in rotation according to merit. The prices will be moderate, and terms easy, and priced catalogues will be sent to every one desirous of purchasing. Fruit and Ornamental Trees, and Shrubs, Green House Plants, Bulbous Flower Roots, Field and Garden Seeds.

Rohan Potatoes, &c. can be supplied, and priced catalogues will be sent to every applicant.

Aug. 31—a4t.

AGRICULTURAL BOOKS
FOR SALE AT THE
Office of the Farmers' Register.

The following publications are for sale at the Office of the Farmers' Register, and will be sent by mail, or otherwise as required, at the following prices, upon cash and post-paid orders.

	The single copy.	Price of [illegible]
Essay on Calcareous Manures, - - - -	50 cents.	[illegible]
Do. on inferior paper,		[illegible]
Johnstone on Draining, Embanking, &c., (latest edition,) - - -	75 cents.	[illegible]
Davy's Agricultural Chemistry, (latest edition,)	75 cents.	[illegible]
Directions for the management of Silk-worms &c. 2nd edition, - - -	25 cents.	[illegible]
Treatise on Mulberry and Silk-culture, by Gideon B. Smith. - - -	12½ cents.	[illegible]

All, or any of these publications may be obtained together, in any proportions ordered, at the wholesale prices stated, for remittances of $5, or more.

In answer to frequent inquiries, it is necessary to state that none of the publications of this office are in any case sent to booksellers, to be sold. Booksellers, like all other persons, may be supplied on the above stated terms; or at a deduction of 20 per cent. on the above wholesale rates, for purchases of $20, sent in advance with the order. EDMUND RUFFIN.

April 20, 1839.

TERMS OF ADVERTISING ON COVER OF FARMERS' REGISTER.

For the space of 20 lines of a column (or one square,) $1 for the first insertion, and 50 cents for each continuance—*to be paid for* in advance, with the order for printing the advertisement. Half the above prices charged for advertisements in the '*Country Advertiser,*' issued monthly from the same office.

SALT WORKS.

Those persons who are really desirous to embark in the lucrative business of Salt Making on the Florida Reef, are respectfully invited to examine Duck Key where the preparatory labor have already been commenced by the undisputed proprietor.

CHARLES HOWE.

IndianKey, 20 th Sept., 1839.—a2t

Haller Nutts
Rodney
Miss

THE

FARMERS' REGISTER,

A MONTHLY PUBLICATION,

Devoted to the Improvement of the Practice

AND

SUPPORT OF THE INTERESTS OF AGRICULTURE.

EDMUND RUFFIN, EDITOR AND PROPRIETOR.

Vol. VII. NOVEMBER 30, 1839. No. 11.

And he gave it for his opinion, "that whoever could make two ears of corn, or two blades of grass, to grow upon a spot of ground where only one grew before, would deserve better of mankind, and do more essential service to his country, than the whole race of politicians put together." *Swift.*

PETERSBURG, VA.
PUBLISHED BY THE PROPRIETOR.
1839.

[This publication consists of four sheets—postage for 100 miles or less, 6 cents—over 100 miles 10 cents.]

Subscribers in arrear will please look here on next No. (12th) for a notice of the amount then due from each.

LIST OF PAYMENTS FOR THE FARMERS' REGISTER, MADE BY SUBSCRIBERS, OR PURCHASERS, FROM NOV. 1st, TO NOV. 28th, 1839.

PAYMENTS FOR VOL. I.

Robert W. Williams	Tallahassee, Fl.
Wm. W. Handy	Somerset, Md.

PAYMENTS FOR VOL. III.

Wm. W. Handy	Somerset, Md.
Thomas C. Gordon	Essex, Va.

PAYMENTS FOR VOL. IV.

Thomas C. Gordon	Essex, Va.

PAYMENTS FOR VOL. V.

Wm. G. Dickenson	Nashville, Te.
Thomas C. Gordon	Essex, Va.

PAYMENTS FOR VOL. VI.

Henry Edmunds	Halifax, Va.
Dialectic Society	Chapel Hill, N. C.
John R. Spotswood	Spotsylvania, Va.
Wm. W. Handy	Somerset, Md.
Wm. G. Dickenson	Nashville, Te.
Ro. S. Motley	King & Queen, Va.
Edward N. Hambleton	Easton, Md.

PAYMENTS FOR VOL. VII.

[illegible] Harkins	Brunswick, Va.
Henry Edmunds	Halifax
Dialectic Society	Chapel Hill, N. C.
John R. Spotswood	Spotsylvania, Va.
Thomas Payne	Greensville, Va.
Wm. W. Handy	Somerset, Md.
N. M. Tanner	Dinwiddie, Va.
John R. Todd	Isle of Wight
W. G. Dickenson	Nashville, Te.
John T. Street	Lunenburg, Va.
Thomas Haynes	King & Queen, Va.
R. S. Motley	do.
James B. Ransom	Sparta, Ga.
Edward N. Hambleton	Easton, Md.
Horace T. Royster	Henderson, N. C.
John Boyle	Washington Co., N. C.
Josiah Collins	do.
Thomas Turner	Bertie, N. C.
James Simmons	Halifax, N. C.
Figures Lewis	do.
John A. Jones	Paulding, Ga.
James H. Stark	Butts, Ga.
Albert Adams	Dinwiddie, Va.
John Tilghman	Queen Anne, Md.
Charles Haynes	Murray, Ga.
D. H. Kenan	do.
L. James	Monroe, Ala.
C. T. Pollard	Montgomery, Ala.

PAYMENTS FOR VOL. VIII.

Frederick Harris	Louisa, Va.
William S. Pettigrew	Washington Co., N. C.
Wm. W. Handy	Somerset, Md.
W. G. Dickinson	Nashville, Te.
C. M. Callis	Louisa, Va.
William C. Haynes	Northumberland

TO CORRESPONDENTS.

Sundry communications received too late for insertion in this number, will appear in No. 12.

PIANOS.

Why go to New York to purchase a Piano, when you can do as well or better in Petersburg, Va.?

The subscriber believes that [illegible] persons would do better to purchase their Pianos in Petersburg than to send to New York for them, for I keep constantly on hand [illegible] selected and choice Instruments, [illegible] in Norfolk, Richmond, Baltimore, Philadelphia or New York, will be found [illegible] quantity [illegible] will be found, by reference [illegible] have purchased from [illegible] of [illegible] the North [illegible] them as at least as good [illegible] way a great deal [illegible] instrument, than [illegible] a beautiful, fine-toned one, because the [illegible] the same advantage in buying a [illegible] others have [illegible] purchase [illegible] would be forced to [illegible]. If an individual purchases a Piano [illegible] should [illegible] have sold nearly one hundred [illegible] bind myself to exchange [illegible] Pianos high and [illegible].

Those who want really fine Pianos [illegible] if they favor me with [illegible] myself [illegible].

[illegible]

Book and Music Store, [illegible], Petersburg.

Oct. 26—[illegible]

MULTICAULIS, ALPINE AND OTHER MULBERRIES.

Wm. Prince and Sons, proprietors of the Linnæan Nurseries, near New York, [illegible] receive orders to any extent for all the various Mulberries, including the Chinese [illegible] American Multicaulis raised from [illegible] hardy, Expansa, Elata, Alpine, Canton, Brussa, Rose of Lombardy, Dandolo, [illegible] the six first named of which [illegible] and are placed in rotation [illegible]. The prices will be moderate, and priced catalogues will be sent to [illegible] purchasing. Fruit and Ornamental Trees, Shrubs, Green House Plants, Bulbous Roots, Field and Garden Seeds.

Rohan Potatoes, &c. can be supplied, and priced catalogues will be sent to every applicant.

Aug. 31—[illegible]

MORUS

MULTICAULIS TREES.

For sale— 15,000 [illegible] 1st February last. They [illegible] and 12 inches from tree to tree [illegible] and having had [illegible] uncommonly fine; most of the [illegible] feet high, and as [illegible] shut up the 4 feet [illegible] of the [illegible] vegetation.

[illegible]

[illegible], Oct. 16th [illegible]

THE FARMERS' REGISTER.

Vol. VII. NOVEMBER 30, 1839. No. 11.

EDMUND RUFFIN, EDITOR AND PROPRIETOR.

For the Farmers' Register.

ESSAY ON VEGETABLE PHYSIOLOGY.

(Concluded from page 626.)

By George D. Armstrong, Prof. of Nat. Philosophy and Chemistry, Washington College, Va.

Chap. XXIII.

REMARKS ON THE APPLICATION OF SCIENTIFIC PRINCIPLES TO PRACTICAL PURPOSES. PROPER CHARACTER OF EXPERIMENTS. SOME EXAMPLES.

In the preceding chapters of this essay, I have endeavored to set before the reader, the principles of vegetable physiology, together with the evidence on which they rest; and occasionally I have mentioned such practical applications of those principles to agriculture and the various concerns of rural economy, as frequent trial has placed beyond question. Whilst preparing this essay for the public, many other practical applications have suggested themselves to my mind, but I have purposely passed them by, lest some error, which a better knowledge of practical agriculture than that which I possess would at once detect, should bring the whole into discredit. In attempting to apply a scientific principle to any practical purpose, there are always many circumstances to be taken into account; and if the person attempting so to apply it fails properly to consider each and every one of these, he will necessarily subject himself to entire failure in the result. Many of these circumstances may be such as are known only to practical men; more especially is this likely to be the fact with respect to a science, which like that of agriculture, is yet in its infancy. If the attempt to apply the principle should result in failure, many persons, not discerning the true source of that failure, will call the principle in question, or perhaps will look upon it as conclusive proof of the uselessness of science, and confirm themselves in the belief of the common sentiment "a grain of experience is worth a ton of theory," understanding by the term theory, scientific knowledge in general. If I mistake not, a great deal of that invidious distinction which is sometimes made between scientific and practical men arises from this very source.

In order that we may see more clearly the true cause of such failures, and may learn what is the inference which may properly be drawn from them, I will mention an example. Sir H. Davy some years since, discovered that a sheet of copper when exposed to sea water, might be effectually protected from corrosion, by soldering to it a small piece of zinc. This was a necessary result from the nature of galvanic action. At once he concluded, and the conclusion seemed a very natural one, that this discovery would admit of a most valuable practical application, in the preservation of the copper sheathing of ships. A trial was made; the sheathing of a ship fitting out for a long voyage was prepared under his direction. When this ship returned from the voyage, and her bottom was examined, it was found that her sheathing was indeed safe, but that it was covered in many places to the depth of more than a foot, with sea-weed and marine molluscæ, and that these, by rendering her bottom rough and ragged, had retarded her sailing so much, that more money was lost in time and the wages of her crew, than was gained in her protected sheathing. Whilst her coppered bottom was exposed to the free action of sea water, it was continually covered with a poisonous coating consisting of the corroded metal, which prevented sea-weed and molluscæ from fastening themselves to it; but so soon as this poisonous matter was prevented from forming, they fastened themselves to the copper with as much, and even greater freedom, than they would have done to a rock or log of wood in similar circumstances. In this instance the failure resulted entirely from not taking this last circumstance into account. Perhaps, had Davy consulted some practical seamen, they might have suggested this difficulty. The principle in accordance with which he acted, was a correct one, and his failure in no way affected the evidence of its truth; and further, this principle may yet be applied to the very purpose to which he attempted to apply it; if some cheap poisonous substance can be found which may take the place of the poison afforded by the corrosion of the metal, or if by any other means, marine molluscæ can be prevented from fastening themselves to the sheathing of ships, and the very failure of Davy may be directly instrumental in leading to some discovery which will accomplish the thing sought; and yet doubtless this failure has been set down by many to the discredit of science.

Lest I should fall into such errors as this, and thus bring discredit upon a study which I believe would contribute more to the advancement of agriculture, (if practical agriculturists would acquaint themselves with it, and make a proper use of their knowledge,) than almost any other which could be mentioned, I have contented myself with giving a simple statement of the principles of vegetable physiology, and purposely avoided attempting to apply them to practical agriculture, excepting in those cases where trial has been already made, and the results have proved satisfactory. In such circumstances, I hope I shall not be thought to be needlessly transgressing the proper limits of my subject, in devoting the present chapter to some general remarks upon the application of scientific knowledge to practical purposes, and the proper character of experiments.

Experimenting has been significantly termed by Lord Bacon, "asking questions of nature." Nature, in all circumstances, is subject to certain fixed and invariable laws. Our world is not a mere chance production which has happened to be what it now is; but in every part is contrived with the greatest wisdom and put together with consummate skill. The only proper object of experimental research is to ascertain these laws, in or that, acting in accordance with them, we m render nature subservient to our will. To attain this end we must be guided by reason in the matter, and not experiment at random; or to carry out Lord Bacon's figure, we should address to nature a definite question, and not speak without reference to the meaning of the language used. It is at this point that science may render us assistance of the most important kind, and this in several ways.

In the first place, a thorough acquaintance with science will save us from spending our time in learning, by the slow and laborious process of experimenting, that which others have learned before us, and left on record for our instruction. How often is it the case, that men of great acuteness, appreciating fully the value of the information to be derived from experimenting, and who might have added much to the stock of human knowledge had their efforts been properly directed, waste their time in learning a second time that which was known long before; and how frequently do we hear of great discoveries, discoveries which are to prove of incalculable benefit to mankind, and which the discoverer honestly believes are now for the first time brought to light, when in fact they have formed a part of human knowledge for many years. In such cases, the experimenter not only loses his labor, but is often mortified, and discouraged from making any further attempts to increase his knowledge of nature. There is but one way to avoid this, and that is to make ourselves fully acquainted with that which is already known. And here let me remark, that true science is not something different from human knowledge; it is in fact nothing more than that very knowledge arranged in such a manner as to be easily acquired, and easily retained. The application of scientific principles to practical purposes, is the very best test of their truth; if they will not stand this test, they form no part of true science, but "of science falsely so called."

In the second place, a thorough acquaintance with science, by drawing a distinct outline between that which is known and that which is unknown, will direct our attention to those points which may most profitably be made subjects of experimental research. It is a remark of one of the ancient philosophers, that the first step towards true wisdom is to know our own ignorance. If this remark is a just one with respect to human knowledge in general, it is peculiarly so with respect to natural science; and no more important work can possibly be accomplished, none which will tend more directly to man's advancement in knowledge, than that which, by placing before him the sum of that which he does know, and carefully distinguishing it from that of which he is still ignorant, shall thus direct his attention to those subjects which may properly and profitably be made subjects of inquiry; and this can be accomplished in no other way so well as by having our knowledge generalized, and presented in the form of scientific principles.

In the third place, a thorough acquaintance with science will assist us, by presenting distinctly before us all those causes which may affect the result which we desire to obtain, and in this way direct us as to the manner in which we shall prosecute our inquiries. There is no portion of matter which is not subject to many laws at the same time; all the different parts of nature are bound together, and interwoven with each other; and on this account an effect may appear to spring from some certain cause, when in fact it springs from an entirely different one. Some of the most common of those errors into which experimental inquirers fall, are those which consist in attributing results to other than the true causes; and so intimate is the connexion which exists between the different parts of nature, that these errors are often of a very complicated character. For example; when the smoke which issues from a chimney is seen to sink towards the earth, we are commonly told, that the air is so heavy that it presses it down; and as evidence that this is the true solution, we are asked if we cannot feel the oppressive weight of the air resting upon our own bodies. In accordance with the principles of philosophy, increase in the density of the air should cause the smoke to rise more rapidly than usual, and not to sink towards the earth; so that in truth, the sinking of the smoke is conclusive proof that the air is specifically lighter than usual. How then can we account for the oppressive feeling of which we are certainly conscious at such times? By a reference to the principles of animal physiology, we learn that in a healthy condition of the human system, a large quantity of fluid matter is continually carried off by insensible perspiration, and that whenever this is checked, a feeling of oppression and languor pervades the whole man. The rate of perspiration, or evaporation, (for it amounts to the same thing in this case, as the one is dependent upon the other,) is materially affected by the dryness or dampness of the atmosphere. That the air should be damper than usual, and at the same time specifically lighter, are two things perfectly consistent with each other, inasmuch as the expansion from heat may be more than sufficient to counterbalance the increased density which would result from the presence of an increased quantity of aqueous vapor in the air. Here then we have a correct solution of the matter, but one directly opposed to the common one. When the smoke, as it issues from a chimney, sinks instead of rising, it does so because the atmosphere is specifically lighter than usual; whilst the feeling of oppression and languor, of which we are conscious in such circumstances, has nothing to do with the density of the atmosphere, but arises entirely from the check which is given to the insensible perspiration, by the presence of an increased quantity of aqueous vapor in the atmosphere. From such errors as these, a thorough acquaintance with science will save us, by setting before us, at one view, all the causes which can be concerned in producing any given result, and at the same time enabling us to assign to each its probable amount of influence.

With respect to experiments, the only remark which I will make is, that they should generally be conducted upon a small scale. By pursuing this course, we are enabled to gain the requisite information without risking any large amount of labor or expense of any kind; and besides, are enabled to attend more carefully to the experiment, and more accurately to observe it in every stage of its progress. If any particular method of culture succeeds well with ten square yards of wheat, for instance, as the laws of nature are uniform, the same method of cultivation will succeed equally well with ten square miles of the same grain.

From this view of the case, we will at once see the error of the opinion so often expressed, that private farmers cannot afford to make experiments; an opinion which has had a very great influence in retarding the progress of agricultural science. It is not necessary, in order to try an experiment, that a farmer should risk his whole crop, or even any considerable part of it; it is far better that he should not that he should experiment on so small a scale that total failure cannot seriously affect him.

Having made these general remarks upon the application of scientific principles to practical purposes, I will now attempt to illustrate them, in one or two cases more immediately connected with agriculture.

In one of the back numbers of the Register, the question is asked, "what is the proper distance at which to place hills of corn from each other," and in connection with this question, the statement is made that, "the results of experiments are discordant," and that "no satisfactory answer has as yet ever been given." In attempting to settle such a matter as this by experiment, there are several circumstances to be taken into account. The most important are, 1st., that a plant in order to to thrive, and more especially to mature its seed well, should be open to the action of air and sunlight, and 2nd., that adjacent plants should not be compelled to draw their nourishment from the same portion of soil. The reason for each of these directions have been given in previous chapters of this essay. Bearing these things in mind, we will at once see why experiments have given discordant results, and why no satisfactory general answer has been given to the question proposed, or can ever be given. The corn cultivated in different parts of this country is not all of the same species, and the different species differ from each other in their height, in the size of their stalks, in the number and size of their leaves, &c. If we have two species of corn, one of which grows twice as high as the other, in order that they may enjoy an equal amount of sunshine throughout their whole length, and for an equal portion of the day, the taller species must be planted nearly twice as far apart as the shorter one. Then again, soils differ much from each other in their texture; some are mellow and deep, whilst others are light, and rest upon a stiff sub-soil. Plant the same species of corn in each of these soils, and from the manner in which the root grows, it will be at once apparent, that in the first, the tendency will be to strike its roots down, whilst in the other, there will be an equal tendency to spread them out near the surface. The roots of two adjacent plants, if we suppose those roots to be of the same length, must run together much sooner in the one case than in the other. The proper distance at which adjacent hills of corn should be placed from each other will depend upon both the particular species of corn cultivated, and the nature of the soil in which it grows, and in performing any experiments which shall afford valuable information respecting the matter in question, both of these circumstances must be carefully noted. If this has not been done, the results of different experiments will of necessity be discordant.

In the 20th chapter of this essay, I have stated the principle, that "plants, as a general thing, resemble their parent plants, i.e. the plants from which the seed from which they sprung was obtained, in form, in texture, in the abundance richness and flavor of their fruit, in their liability to disease, and in fact in almost every particular which can affect their value to man." When this principle was stated, it was dismissed for the time, with the intention of resuming its consideration in this place. Let us see if it will admit of any practical application in agriculture.

One of the most common misfortunes which disappoints the wheat-grower's hopes in eastern Virginia, is the rust. This I believe is generally considered, a diseased condition of the stalk produced by a peculiar condition of the atmosphere. If it be true that this disease is owing entirely to the influence of the atmosphere, then any attempt to remedy it must be hopeless. But is this certainly the case? May it not be, that whilst a particular condition of the atmosphere, or a particular kind of weather, is the immediate cause of its developement, a predisposition to the disease exists in the plant itself? And may not this predisposition to the disease be of a hereditary character? The fact that the rust is now more common than it was formerly, seems to favor such a supposition. If such should be the case, then the most effectual means of preventing the disease, would be to provide seed-wheat from a stock which had never been affected with the rust.

There is a striking similarity in all these particulars, between plants and animals. We know that in the case of man, certain diseases, or rather, to state the case more accurately, a predisposition to certain diseases, is transmitted from parent to child, whilst the immediate cause of the disease, in each particular case, is entirely of an adventitious character. The consumption is of this character. If we place two children of the same consumptive parent, children, so far as we can see, equally predisposed to that disease, the one in favorable circumstances for its developement, and the other in unfavorable circumstances, the one will die, whilst the other will survive. Or if we take two children of different parents, one of whom has inherited a predisposition to consumption, whilst the other has inherited a sound constitution, and place them both in circumstances favorable to the development of that disease, the one will die, whilst the other will live to a good old age. So far as we can see, the same law obtains in the vegetable as in the animal kingdom in this particular; at any rate, such is the conclusion to which observation and experiment would lead us. Why may not the rust be a disease of this character; depending for its development upon a particular condition of the atmosphere, but the predisposition to which, is deep seated in the very constitution of the plant? I do not mean to assert that such is the case, for I am not sufficiently acquainted with the fact of the case, to make up a decided opinion, though all the facts with which I am acquainted would favor this view of the matter. I mean simply to suggest the question, and in case those better acquainted with the matter should think that this is the fact, to point out the proper remedy.

Again; "plants as a general thing resemble their parent plants in the richness and abundance of their seed and fruit, as also in the time of ripening that seed." Some years since I tried an experiment to ascertain to what extent this was true;

At the time, I made no notes of the experiment, and of course cannot be perfectly acurate in my statements; but yet I shall not vary far from the truth. The plant on which the experiment was tried, was the species of bean called in Thorburn's catalogue, "refugee or thousand-to-one bean," an excellent species of snap. Having selected a row of beans at the time when they were first setting, on one half of the row, I suffered those pods which set first to ripen, carefully removing those which set afterwards; on the other half of the row, I removed all the first pods as fast as they set, leaving none but two or three of the last that set to ripen. When fully ripe, the two varieties were gathered and carefully kept seperate from each other. The next spring I planted both varieties at the same time, and side by side, but no two different species of beans could have differed more from each other than these did. The first variety were fit for use at least three weeks before the others; the plants of the first were low and stiff, whilst those of the other were tall and slender, in one or two instances having something the appearance of vines; the beans when ripe differed in shape, size, and even in color; those of the early variety being pink, whilst those of the late variety were deep purple. But the greatest difference was in the amount of the yield, the early variety averaging from 6 to 10 pods to each plant, whilst the other variety averaged, I think, at least from 30 to 40. And yet each variety preserved the original characteristic of the refugee bean, viz. that of having a tender pod, and thus affording a good snap bean. Had not circumstances prevented, I should have pursued this experiment, and from the results which I did obtain, I have no doubt, that in the course of a few years I should have obtained two entirely distinct varieties, one of which would have afforded the earliest snap bean which could be raised, though its yield would have been by no means abundant, and this, by the way, is the fact with respect to every variety of early beans and peas that I have ever seen, whilst the other would have afforded a late snap, and yielded most abundantly. Just how far other plants might be affected by a similar treatment I am unable to say; but if the general principle which I have stated be correct, and it is a principle based upon the results of many experiments, performed on many different kinds of plants, and by many different experiments, every plant will be affected to a greater or less extent, and doubtless all to such an extent as to materially affect their value. Very often, the seed of early and late varieties, or of some prolific variety of a plant, is obtained from a distant part of the country, with great trouble and at great expense, and after all, is found not to succeed well in our climate; would it not be a much easier and in every respect a much better plan, to select some variety which possesses all the qualities excepting those of being prolific early or late, and then obtain varieties which shall be what we wish them in this respect, by such means as those referred to above? I know that some farmers have given a certain amount of attention to this matter, but I doubt whether those who have given most attention to it, have ever pursued the matter as far as it might profitably be pursued. The results have in every instance been of the most desirable kind, and this method seems to be one of the easiest and most certain methods of improvement open to the agriculturist; why then should the matter be suffered to rest where it does!

In order to bring the subject of selecting seed with great care, because the offspring will partake of the character of the seed from which it springs, and also to point out some of the precautions to be observed in order to do this successfully, let me refer to a fact stated in one of the back numbers of the Register. In the No. for Oct. 1838, there is the following article.

"Many years ago, a farmer in this quarter, who cultivated the same variety of wheat and in the same manner as did his neighbors, was known to have a yield of a third more to the acre. Upon inquiring as to the cause, the unsatisfactory answer was given—"I sow barrel seed." The neighbors purchased of him their seed wheat, and the first year had a yield equal to his, but selecting their seed as formerly, the second and third crops were but little if any better, than was raised by them previous to their purchase of seed. They again purchased, and their fourth crop was equal to the first, but their fifth and sixth crops, were like their second and third. How to solve this apparent mystery, caused many a neighborhood consultation and discussion. The vender of the seed saw too inviting a prospect to make money from the sale of seed wheat to induce him to disclose the manner of its preparation, and he struggled to keep it concealed. It was ultimately discovered however, and was as follows. When you are ready to get out your wheat, place a barrel or box in your stack-yard, open at one end, before you pass the bundle to the treading floor, give it one or two strokes a cross the open end of the barrel or box, by which the best matured grains will be shattered off, then winnow and used for seed. Thus prepared it will be far superior to the seed prepared by running it through a coarse sieve, for it is known to every observant farmer, that many of the largest grains of both wheat and rye are unripe or diseased, and yet they do not shatter out as easily as those which are perfectly ripe."

Taking these statements as true, and I see no reason to doubt their correctness, let us see what a careful attention to this matter will be worth to the wheat grower, counted in dollars and cents. Seed wheat selected in this way would cost him nothing more than the price of the labor necessary to strike the bundles upon the barrel, before passing them to the thrashing machine, above the price of as much wheat measured without any selection from his whole crop. Let us put this at 10 dollars, and this I am certain is five times as much as it would cost. If his ordinary crop is 1000 bushels, by pursuing this plan, with the same amount of labor and from the same quantity of land, he will obtain 1333⅓ bushels. Estimating this at $1 per bushel, the market price as given in the last number of the Register, we have

Crop by improved cultivation worth	$1333⅓
Crop by ordinary cultivation worth	1000
Gain	333⅓
Deducting price of labor in selecting seed - - - -	10
Clear gain	$ 323⅓

If his ordinary crop is one of 5000 bushels, his clear gain will of course be 1616⅔ dollars. About this calculation there can be no error, if the data on which it is founded be correct; for these of course I am not answerable, I take them as I find them stated by a practical farmer, and I see no reason to doubt their correctness. Is not this matter then worthy of the attention of farmers?

It would be easy, did it seem desirable, to multiply instances of the application of the principles, stated in the preceding chapters of this essay, to practical purposes; but having stated the principles themselves, together with the evidence on which they rest, I now leave it with those farmers who may have given the essay a careful perusal, to make the applications for themselves. If by what I have written, I shall have given any information to my readers, or if I shall have only called attention to that which they knew before, but which they suffered to be amongst their neglected knowledge, and in this way shall have contributed in any degree to the advancement of the cause of scientific agriculture, I shall feel that I have not written in vain. And in conclusion, let me remark, that whilst it is beyond a question, that the prosperity of this "our good old commonwealth" is indissolubly connected with the prosperity of her agriculture, at the same time it is true, that our systems of agriculture are far from what they ought to be, and far from what they will become, when once attention is thoroughly awakened to the subject.

URATE AND POUDRETTE.

From the New England Farmer.

New York, 21*st. Sept.*, 1839.

Sir—The New York Urate and Poudrette Co., finding that gentlemen who had purchased their manures had been experimenting with the articles, some advisedly and others mistakenly, it became desirable for many reasons to learn—

1—On what particular grains or garden vegetables the manure was used, the quantity applied, and the result:

2—To know the precise manner and result of each trial:

3—How the urate and poudrette compare with other manures in their effect, and

4—Generally, whether it was not desirable to the farmer and gardener to have the contents of sinks and privies made into *inodorous* manures.

In answer to their circular sent to Mr. Linn, of Schenectady, they have received a letter of so interesting a character, that we ask the publication of it at as early a day as your arrangements and convenience will permit.

Amended instructions, the result of information received, will be published in a few days for *gratuitous distribution* among those who have or may wish to use the manures.

(COPY.)

Schenectady, Sept. 19, 1839.

The New York Urate and Poudrette Company.

Gentlemen—In answer to your "circular," I would say, that I obtained from your company a barrel of poudrette last spring, intending to test its value as a manure, by a few close and accurate experiments. It came to hand, however, so late in the season, that I was unable to apply it as I intended, or to arrive at results which would in all respects prove the value of the substance as a manure, or the best modes of applying it. I applied it to a variety of vegetables in my garden, and also to a small portion of a field of corn of about five acres, at my farm in the vicinity of this city. The vegetables in my garden have grown with unusual richness and luxuriance, and have most evidently felt the effects of the application. Of the results at my farm I can speak more satisfactorily, because there I can compare the portion which *has*, with another portion of the same crop, in the same field, which *has not* received the poudrette. This crop is upon a strong, rich soil, which had been slightly manured in the hill from the fold-yard at the time of planting. At the first hoeing, and when the plants by reason of the unfavorable season were extremely backward, I directed my farmer to apply to a corner of the field, where the crop was the least promising, a handful of poudrette to each hill, covering it at the same time with a thin coat of earth. This was faithfully done until the poudrette was consumed. The remainder of the field received, a part the usual dressing of *plaster*, and a part of *ashes*. The plants to which the poudrette was applied, were the first to change color—throwing off the sickly, yellow hue, and adopting a deep green. At the period of the second hoeing, the same plants retained not only the appearance of better health, but had obtained greater vigor and more size than any others of the same crop. They have held the same distinction throughout the season; and it is now plainly visible, although the entire crop is a fair one, that when we come to harvest, we shall gather a greater weight of stalks and more grain from the portion where this manure was applied, than from the same space at any other point in the field. We have certainly no experience proving that the same results could have been reasonably expected from the application of any other of the various manures in common use.

With us, plaster has long been considered the grand restorative for this crop, and ashes, with many farmers, almost a specific; and indeed that both substances are very useful as manures on most varieties of soil, is universally conceded. Mills to grind plaster for manuring purposes, are as common throughout this part of the country as those devoted to grain; and I have seen boats loaded with leeched ashes,toiling their way from the far west, in order to enrich farms on Long Island.

In this experiment, poudrette was applied side by side with plaster and ashes, under circumstances in favor of the latter, and yet they have most indisputably yielded the palm to the former; and all this is not without reason. *Heat* and *moisture* are the sources of vegetation: poudrette, if it have *it* not in itself, will generate more heat, and for a longer period, than either plaster or ashes, and will absorb and retain more moisture. It seems, also, to decompose inanimate vegetable substances in the soil with which it is mixed, and so to diffuse and incorporate itself with the soil as to change its color around the plant to which it is applied. Like most other manures, (only more sensibly and rapidly,) it imparts of its qualities to every substance with which it comes in contact, and by the aid of its own and borrowed heat and moisture, assimilates all to itself and thus exercises, although applied in most inconsiderable quantities, a certain and immediate influence on vegetation.

I regret that I did not receive the article so as to apply it at the time of planting. I am not sure that the results would have been more successful, and except for the purposes of experiment, I should be content to use it hereafter on most crops, as I have done this season.

Desiccated manures have long been appreciated in Europe. There, one ton of them have been estimated to be equal in fertilizing properties to thirty-six tons of barn-yard manure. At this rate, there is a large balance on the score of economy in favor of the former: and when it is remembered that the manures, as prepared by your company, are wholly inodorous, and may be conveyed in barrels to the most remote parts of the country as commodiously as flour, and at a trifling expense, our agriculturalists should be moved by every consideration connected with cleanliness, rural economy, the productiveness of the soil, and the right use of the means which providence places before them as incitements to industry, to promote the use of substances, which, left undisturbed, are worse than useless—scattering in our large cities and towns disease and death, and which, when submitted to your *alchymy*, spreads health and verdure, and blesses and rewards both citizen and husbandman.

I shall be pleased to receive your "improved instructions" for using the manures, of which you speak, and to know at how early a day this fall I may order a few barrels* for future experiments.

Very respectfully, yours, &c.

A. L. Linn.

The following is a copy of the improved instructions alluded to in the foregoing:

Manures.

The attention of the public has recently been directed to the use of urate and poudrette. It has long been known in France as the most efficacious of all manures, and the experiments made during the past and the present year, viz: 1838 and 1839, in the use of poudrette in the northern and eastern states, but more especially in and around the city of New York, have awakened the attention of both farmers and gardeners. The Royal Academy of Agriculture in England, have caused experiments to be made of the respective power of the different manures, and upon trials so made, it appears beyond a doubt that manure made from sinks and privies, is superior to any other productive agent for agricultural purposes. Is it necessary to add, that it is worse than labor lost, to cultivate worn out or poor soils without the use of manure? He who expects to be liberally rewarded for his labor must give liberally what nature requires. The wise man has said, "he that watereth shall be watered also himself."

Amended Directions.

Directions for their use were given by Peter Barthelemy, (who was one of the first discoverers in France of the present system of preparing the articles,) how and in what manner they should be applied, and who recently introduced their manufacture in the city of New York. Many of the persons who have used the articles, have found, from practical experiments, that the former directions may be amended advantageously, and it is doubtless the case that many new methods may be discovered, which it is hoped will be communicated for public benefit.

Urate is the product of the *liquid* part, and poudrette of the *substantial* part of the sinks or privies, both of them reduced, by a different process, to a dry and inodorus substance, and used as the best of all manures known to agriculturalists and horticulturalists, being an animal manure of the richest and purest kind, and the most powerful of any application that can be made to the earth.

Urate.—The urate may be used in its dry state by spreading it on the land as you would lime or ashes, or, after having been dissolved in water, may be used through a watering pot, or by a cask on cart wheels, in the same manner as the streets in the city of New York are watered in summer.

For all kinds of small grains, such as wheat, rye, oats, barley, flax, and others of the like kind, it may be sowed dry upon the soil, in the proportion of 12 to 18 bushels per acre, according to the quality of the land, and then harrowed in.

For corn and potatoes, and such like, it is best to mix the urate in an equal quantity of dry soil, and put in the hill about a gill or handful, sprinkled around the seed corn and potatoes as is usually done with ashes.

For beets, turnips, or other vegetables sowed or planted in drill, the urate is to be prepared in like manner and sowed in the drill.

For grape vines, fruit trees, flowering trees, flowers, also for garden vegetables, such as cauliflower, cabbage, melons, cucumbers and the like, urate may be dissolved in water, in the proportion of one pound to a gallon of water, and poured on the subject; one application is sufficient; and for articles not herein enumerated, it may be sowed dry on the surface of the ground.

Where the land retains water during the winter, urate must be used only in the spring, in order that its salts may not be absorbed in too large a quantity of water.

Where the land is dry or does not retain water during the winter, urate may be used in the autumn—if, however, the sowing takes place shortly before the hard frosts, it is better to use urate only in the beginning of spring.

As a general rule, more urate is required upon the same quantity and quality of land in autumn than in the spring; if used in the spring, it is better to apply the urate in a damp day, or immediately after a heavy rain, if it cannot be applied shortly before the rain, as it is a light substance, liable to be blown from off the land by high winds.

There is a great advantage in soaking corn, oats, and all other grain, for twelve hours only, in a solution of urate, prepared as above directed, before planting or sowing it, and then rolled in lime or plaster, the corn or grain will start sooner, be stronger, and less liable to attack by worms or birds: but care should be taken not to suffer it to remain longer than about twelve hours in the solution, else you might destroy the germinating quality of the grain. It has also been found beneficial to soak timothy and clover seed in urate or poudrette for about four to six hours, and then rolled in lime or plaster, the seed comes up better and grows stronger than other seed sown at the same time in the same field.

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* The company have several thousand bushels for sale at the present time.

Poudrette.—Poudrette is not dissolved in water before being used, as is urate, but it is to be used in a dry state, or by mixing it with dry soil in hills or drills, or sown in broad-cast on the land, as you would lime or ashes. Experiments in this country, thus far, have proved the following methods as the most advisable in its application:

For Corn.—After the furrows have been struck, sprinkle in the place where the hill is to be, before planting, a handful of poudrette, equal to about a gill, then deposite the corn, (double that quantity of poudrette has destroyed corn and burnt it up,) then cover up the corn and press the earth down over it with the foot or hoe.

For Potatoes.—The same quantity, namely a handful or gill, may be used very advantageously; and it has so happened, that when the quantity was increased nearly double, no injury resulted, but rather improved the potatoes: a large handful, however, is sufficient.

Compost.—It is worse than useless to attempt to make compost by mixing urate or poudrette with any thing but dry soil; if mixed with other manures, they operate on the other manures until those manures are consumed, before they are beneficial to plants; and in some instances it may be, that the results of the use of the urate and poudrette in the *first* year of their *first* application, will not be as satisfactory to the farmer as he will think he had a right to expect; this arises from the fact that the land contains a considerable quantity of some former manure upon which urate and poudrette will first act; at the very next season, however, the farmer will find a crop far superior to his expectation, provided he will put no new manure of any description to the land lately manured with urate or poudrette.

This, however, must be further explained by saying, that it applies to manure placed or dunged in the hill, or where the land is in a high state of cultivation, from having been highly manured in broad-cast, which would give the poudrette an opportunity of feeding upon or consuming it. Experience has proved, this year, that where there was a moderate application of lime, or barn-yard manure applied to the land in broad-cast, it did not appear to affect the influence of the poudrette on the crop.

The quantity of poudrette must vary from 15 to 35 bushels per acre according to the quantity of the land, and the crop cultivated: less than 15 bushels to the acre may not be very satisfactory, and more than 35 is useless.

On Long Island, the following has been adopted by a practical farmer with success. For wheat, he used to apply 20 wagon loads of 30 bushels each, equal to 600 bushels of horse manure, which cost him $20, besides carting 20 loads. He now applied 40 bushels of poudrette which cost him $16, and can carry more than sufficient for one acre in a load.

For rye, 450 bushels of horse manure, and now 25 bushels of poudrette.

For oats, 350 bushels of horse manure, and now 20 of poudrette.

For buckwheat, 200 bushels of horse manure, and now 15 of poudrette.

Indian corn, one gill in the hill.

Urate and poudrette are light substances, and liable to be blown off the ground by high winds, if sowed on the surface when the ground is not damp; therefore, it is considered best to sow the grain and harrow the land once, and then sow the manure in broad-cast and cross harrow the land the second time.

The difference of the season between spring and autumn, and the state of the atmosphere, are to be considered before using either urate or poudrette; damp weather is always to be preferred. Neither of them contain any seed of weeds of any description. An application of 35 bushels to the acre of urate or poudrette once in every three years is sufficient.

Urate and poudrette may be sent to any part of the country in barrels or bags—barrels are to be preferred when it is liable to get wet. Orders may be given, post-paid, directed to "*The New York Urate and Poudrette Company,*" box No. 1211, post office, New York.

ANCIENT AND PRESENT AGRICULTURAL CONDITIONS OF THE HOLY LAND.

Extract from Addison's 'Sketches of Jerusalem.'

Hecatæus, a Greek historian, who flourished 549 years B. C., speaks of the great fertility of the land belonging to the Jews; and Polybius, B. C. 170, states that the eastern part of the country, about Tyre, furnished abundant supplies to the army of Antiochus. Diodorus describes the inhabitants, fifty years B. C., as generally living upon flesh and milk; he speaks also of the pepper which was produced upon the trees, and of the abundance of honey which, according to a later historian, the country people used as a beverage, mixing it with water.[*] Pliny also celebrates the palm trees, and the oil and the balsam; and other writers enthusiastically speak of the land as "the fortunate country," "the country abounding in pasture."[†]

They describe the two Galilees as covered with all sorts of trees, and the soil as everywhere so rich and fertile, that the most lazy were encouraged to cultivate it from its fruitfulness. Samaria is celebrated for its kind and genial soil, its sweet waters, its abundance of trees, fruit, and cattle, and also for the delicious milk it produced, in consequence of the quantity of grass. Gennessareth, too, is spoken of as a delightful region, in which all kinds of trees flourished, the nut, the palm, the fig, the olive, and the vine; and the valley of the Jordan has been widely celebrated as "a garden environed with hills," "a celestial region," delightful for its trees, fruits, and odoriferous balsam.

At a subsequent period, A. D. 313, when the country had much declined from its flourishing state under the Jews, it is still celebrated by Eusebius for its oil, corn, wine, vegetables of all kinds, honey, palms, fruit trees, cattle and beasts of burthen; and later still, towards the close of the fourth century, Hieronymus a native of Palestine, observes "That the celebrated land of Judea excels all land in fertility, no one can doubt, who hath marked well the country from Rhinocorura to Mount Taurus and the river Euphrates, the power of the cities, and the pleasantness of the climate."

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[*] Ammianus Marcellinus, lib. ix. c. 104.

[†] Josephus. Tacitus. Ammianus Marcellinus.

A faithful description of the state and appearance of the land at this day will present a picture exactly the reverse of that sketched above. There are now no chariots of iron nor of wood, nor carriages of any description, not even carts upon wheels, throughout the country. There is no such thing either as a carriage road, or any made road at all. In the mountains and rocky districts, the marks of horses' hoofs worn into the surface of the hard stone alone point out to the traveller the direction of his rout; and in the plains, the devious tracks and bridle-paths, except where the vegetation is strong and vigorous, are entirely obliterated after high winds and heavy rains, and the course of the traveller is then entirely directed by some bold mountain or well-known eminence.

Instead of the country covered with all sorts of trees, and the genial soil refreshed with sweet waters, and clothed with an abundance of grass, the eye now wanders either across wide and cheerless plains, parched and dusty, and unrefreshed by one single solitary tree, or across rugged and desolate districts of naked rock and loose shingle, where neither a drop of water nor a blade of grass is found to relieve the monotony and nakedness of the surrounding desolation. The footsteps of the traveller are ever and anon conducted across wide and fertile plains, covered wirh a fine black mould but except in the immediate neighborhood of a few solitary hamlets, perched by the side of a scanty rivulet, at wide distances from each other the whole surface of the soil is left neglected and totally uncultivated. During six months in the year it is covered with thistles and rank herbs; the earth is parched and cracked into wide fissures, and not a single drop of water can often be found for half a days journey, and yet the land was once described as "a land of brooks and of water, of fountains and depths, that spring out of valleys and hills."

In the winter season, when the rains fall and moisten the dry seeds which have been scattered in the dust by the ripened vegetation of the preceding summer, these wide plains begin to assume some appearance of freshness and of green; but ere the young and vigorous vegetation of the new year has well made way through the dead and rotting stalks of the preceding season, it is in its turn brought to maturity; and soon after killed and dried up by the burning rays of the summer sun. A stream of water in this thirsty country in an almost invaluable treasure, and wherever a brook refreshes the soil, there a small hamlet is found to be perched, and the water is exhausted in irrigating the adjacent land, and supporting the few radishes, turnips and other roots, which, with unleavened bread, or roasted Indian corn, constitute the food of the inhabitants.

The milk of the goat, or of the dromedary, is the only milk now procurable, and the eye searches in vain for the rich pastures, and the abundance of cattle described by the old writers. The ground in the neighborhood of the villages and towns, with one or two solitary exceptions, is cultivated only for a mere subsistence; there is no valuable produce growing on the soil, and no accumulation of wealth and capital upon the surface of the country. The vineyards are all wasted and destroyed, except here and there a vineyard belonging to the convents, and wine is nowhere to be met with, except in the houses of some of the Christians, or in the cellars of the monks. The delightful groves of all sorts of trees, so lavishly praised in times past, no longer extend their shade over the bald and naked country; and, excepting the fruit trees in the gardens of the villages, and the few olives, which at Samaria and in some other places afford an agreeable relief to the eye, the whole landscape is entirely treeless.

When we hear of the "store cities" of times past, of the "cities great and fenced up to heaven," and of the strong and populous towns with glittering towers, "*turribus in cœlum nitentibus*,"* we can scarcely believe that this thinly peopled, poor, and solitary country can be the one so celebrated by ancient writers. Excepting the icy regions of the north, the wild deserts of Syria, and the vast stony and sandy plains of Africa and Arabia, there can scarcely be a more solitary, deserted, and poverty stricken country in the old world, than Palestine as it now exists. From Damascus to Gaza, a journey of a fortnight, Jerusalem, Naplous, and Jaffa, can alone be said to maintain the rank of towns Nazareth, Tiberias, and D'jenneen are no more than large villages of mud houses; and Tyre and Sidon, and the sea-ports, destitute of wealth and commerce cannot be placed in the same rank with the most miserable fishing-town in the island of Great Britain.

The country being unenclosed and unappropriated, the right of ownership, exists in the sheikh or chief of the nearest village, as a sort of lord of the manor, who exacts a tribute, when he is strong enough to do so, from the Bedouin Arabs and wandering tribes of Turcomans, who, during their migratory excursions, feed their dromedaries and goats upon the rank herbs. In all the villages and scattered hamlets, which here and there diversify the monotonous surface of the treeless solitude, the houses are alike destitute of furniture, of even the commonest domestic utensils. The people are clothed in tattered garments, and the sickly children, with pale and bloated countenances, in many places, present a sad aspect of want and misery.

The present condition of this interesting country is most remarkable, and well worthy of deep consideration, when taken in connection with the history of the Jews, and the language of prophecy.

CONSIDERATIONS ON BUYING AND RAISING HOGS IN VIRGINIA.

To the Editor of the Farmers' Register.

If it is a fact, as some persons think, (and they say the opinion is founded on actual experiment,) "that oats do not injure land," it may be doubted with good reason, if that crop might not be made more valuable through the whole region of sandy or light lands, than the crop of wheat. It is good food for hogs, cows and sheep, and when you consider the great number of each, annually brought from the western part of Virginia, and from other states any plan for home supply should be well investigated before it is denounced as wild. The place in which you live, (Petersburg,) consumes perhaps 15,000 hogs of the average weight of 150 lbs., at six dollars a hundred, or nine dollars a hog, the annual amount paid, will be one hundred and thirty five thousand dollars. How the physical strength produced and sustained by eating all this pork is employed, I (a stranger,) do not know; but if your fellow citizens spend a proportional sum in other things, I am afraid they are in a fair way to eat off their heads. Of this sum, a very small part is left by the drovers; they sometimes buy a negro or a stallion, but by far the greater part is carried back to furnish the means to the country merchants, scattered throughout the whole stock country, of making remittances to the Atlantic cities. And I expect the notes are returned to our banks at least as soon as they wish to see them. Hogs that run at large can be kept in growing order on a ear of corn a day; and a quart of oats would certainly be equal to it. A little less than eleven bushels and a half, then, will give a year-old hog, weighing one hundred pounds and worth six dollars when fat; and to do that will require half a barrel of corn at the least, the value two dollars, which would make the 100 lbs. of pork cost about seven dollars. But Mr. Editor, I never raised a hog in my life, on such luxurious living. From the 20th of May until my hogs are brought to the pen, 1st November, I rarely feed them once a week, so that for five months and a half, feeding is out of the question. An acre of clover will keep in good condition, say six or eight hogs, until the first of July, at which time they begin to glean the harvest field. The feed saved during the growing season will surely fatten the hog, and 100 lbs. of pork will not cost me six dollars. This 100 lbs. of pork, if raised by one dealing in Petersburg, is spent on the spot for something or other which he thinks necessary, or his wife *could not live another day without*. These hints can only be profitable to those who live near uninclosed land and have dividing fences, or those who have good standing pastures. Suppose fifty thousand dollars of this outgoing had been saved and divided among the community trading with Petersburg annually, for the last four years, don't you think the benefit would be felt by all classes? I hope some persons better informed on this subject than I am, will give us his thoughts.

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* Rufus Avenius.

I sall resume the consideration of this subject, in a future number. J. P. BOLLING.

Amelia, Oct. 26, 1838.

MANAGEMENT OF GRASS LANDS.

(Concluded from page 636:)

2. *Pasturage.*

Much of the land of this country has never been cultivated, but produces without cultivation the herbage plants peculiar to it; such are all our mountain pastures, and the unimproved surface of the lower plains.

It is an error to apply the term waste to lands of uncultivated pastures. They are in no degree waste, but are employed in producing the species of food which, in the circumstances in which they are placed, may be the best which they are suited to produce. It may be supposed that, by cultivation they will yield a more abundant produce, but it is always a question of prudence, whether the the profit in cultivating them will be greater than that derived from them in their natural state.

A primary improvement of which lands unsuited to cultivation are suceptible, is freeing them from stagnant water. This is for the most part to be effected by affording an outlet to the water in channels cut in the most convenient places. This should never be omitted where the land is of sufficient value to repay the expenses; and it is rare when land is of sufficient fertility to produce the grasses at all, that the expense of giving an outlet to the surface water will not be repaid by the increased value of the herbage-plants produced.

A species of draining, which has been practised to a great extent in some of the mountain districts of this country, is by means of narrow drains, about a foot in depth, made by the spade alone, carried along hollows, wherever the water is likely to be interrupted. By this species of draining, an important improvement, at no great expense, has been effected in many mountain pastures; and the tendency to rot, one of the most fatal disorders to which sheep stock on wet land is liable, lessened or removed.

Another method of improving the natural pastures of an elevated country is enclosing. In this way the animals of a farm are confined to the pastures which are suited to them, and permitted to feed undisturbed. And a great improvement of all elevated pasture lands is shelter for the stock; and judicious planting, accordingly, is one of the means of increasing the value of exposed pastures.

But land is not only left in grass in parts of the country incapable of cultivation, or in cases where cultivation would not repay the charges incurred, but much even of the better land is kept in grass, when it is found that in that state it yields a more safe and steady profit than if cultivated. It is also, in all cases, a renovation of the productive powers of cultivated land to allow it to remain for a period in grass; and hence a large proportion of the whole country remains in that state.

The animals that may be pastured in all lands under grass are our different kinds of herbivorous stock. Cattle and horses require a large quantity, and, though they prefer the finer grasses, are satisfied with a coarser herbage than sheep. Hence, a rule of the farm is, to put sheep on finer and shorter grasses in preference to cattle and horses, and cattle and horses upon the larger and ranker pastures.

Whatever be the animals that are turned out to pasture, the rule is, that the pastures should never be overstocked; that is, that there shall always be a sufficient quantity of food for the animals.

When animals are kept in the fields during the months of winter, they must of necessity remain there till the herbage rises in spring. But when they are not kept throughout the winter in the field they are not usually put to the pastures in spring till these are sufficiently advanced to receive them. The usual period is April or May, when our various animals are put in their respective pasture-fields for the summer.

The benefits of freeing lands from injurious wetness have been adverted to in the case of upland pastures. They are yet greater in the case of the pastures of the the plains, inasmuch as the the relative value of the land is greater. In this case, not only should surface-water be carried away by ditches and open drains wherever necessary, but under draining should be resorted to, to free the land of wetness. By removing under-water, a more valuable species of herbage is preduced, and the tendency to produce inferior plants lessened.

In the management of land kept in pasture, no manuring is required to maintain its fertility, which will be increased and not diminished by the effects of pasturing. Any species of manure, however, will add to the productiveness of land in grass; and when, from any peculiar cause, it is thought expedient to manure land in grass, the best kind of manure is usually lime or composts of earth and lime. These are simply spread upon the surface, when vegetation has become inert at the fall of the year, or before it has become vigorous in spring.

The surface of land kept in grass becomes uneven from several causes. One of these, is of yearly occurrence, the labor of the mole. In spring the mole-hills should be spread regularly by the hoe or spade; and, to prevent the animals from becoming numerous, they are taken in traps.

Another creature, too, scarcely known in some parts of the country, but very troublesome in others, is the ant. The hills raised by the ants are unsightly and hurtful, and there is great difficulty in driving the little creatures from the habitation which they have so carefully constructed. The hills, forming little eminences like small hay-cocks, will sometimes cover a large part of the surface. The methods recommended for destroying the ants are, raising the sods containing them by the spade, and burning them in heaps; or, just before winter, dividing the ant hill with the spade, and laying the contents upon the surface.

The chief injury, however, which land when left long in grass is apt to sustain, is the decay of its herbage by the springing up of inferior plants. The most common of these are the *musci*, mosses.

The mosses are altogether innutritious. They occupy the place of the herbage plants, and thus render the pasturage of less value. They are most apt to grow where the soil is inferior and moist.

The best method of destroying this class of plants is by draining and liming; and old grass-land, when overgrown by these and other unproductive plants should be taken up and undergo a course of tillage.

When it is inconvenient to break up the land, or when it is wished for any good reason to retain it in grass, the improvement of the sward may be attempted without tillage, although this will be found to be more expensive and less effectual. Rakes and harrows, with close-set teeth, may be employed to pull up the mosses; but this, which is merely a palliative, leaving the cause of the production of the plants unremoved, should be accompanied with draining, when necessary, and the application of calcareous matter to the surface. A somewhat more efficient mode of improvement is, to pare off the surface with the spade to the depth of a few inches, and then, after stirring with the harrow the soil below, to replace the sod. The productive powers of old turf will be renovated by this process, and especially if any lime or calcareous manure is applied before the sod is replaced.

When land is kept in grass, weeds of various kinds may tend to occupy the ground in place of the more useful herbage. The smaller kinds of these can only be eradicated by improving the ground itself. The larger weeds, as thistles, docks, ragweed, and others, should be pulled up or cut over when they come into flower, or before it. The best instrument for the the latter purpose is a little spade, carried in the hand, by which the stem of the weed is cut at or below the surface. The scythe, too, must be used, to cut down such plants as tend to overshadow the ground; and this should always be done before they have ripened their seeds. Whins, when old must be hoed up, which is generally an unsatisfactory operation; but young whins may frequently, when the weather is moist, be pulled up by the hand. All suckers of trees, too, should be pulled up as soon as they appear.

The very detail of these circumstances, however, shows the expediency of taking up old turf for a course of tillage whenever it tends to produce injurious plants. It is in this way only that they can be thoroughly eradicated, and their place supplied by better herbage.

SILK CULTURE IN CONNECTICUT.

From the Silk Farmer.

The following letter, addressed to Col. Smith, president of the meeting [at the Franklin Institute] has been handed us for publication. We think it possesses peculiar interest, and should be attentively read by all. Mr. Badger is the present proprietor of the Marshall House, Philadelphia.

Philadelphia, Sept. 25, 1839.

To the President of the Silk Meeting:

Sir—I spent about thirty years of my life in the adjoining town to Mansfield, Connecticut—my farm being partly in Mansfield. During these thirty years a very considerable portion of the farmers in Mansfield fed the silk-worm and made silk. This was done by the good housewife and her children. I was conversant with the business, and never had an idea that there was any mystery at all in it; the eggs, when exposed to the air, hatched without any assistance; the children picked the leaves, and the mother generally fed them; the worms ate of themselves, and wound their cocoons. The wife usually reeled the silk whenever leisure from other duties permitted, so that no expense accrued to the family. She not only reeled it, but twisted and manufactured it into sewing silk. And it is a fact, that those farmers engaged in the silk business, made from it from one hundred to six hundred dollars a year, while the whole of the other produce of the farm did not yield the half of that sum. The consequence was, that the silk growers were not only free from debt, but they and their daughters always had money at interest, and the latter, when married, had always something handsome as a wedding present for their husbands.

With these people the worms were fed in the farm houses, and all the expense incurred was for a few hundred feet of boards. The work was done, let me repeat, in the family and by the family. The land in Mansfield is generally not well adapted to cultivation, and a Pennsylvania farmer would be unwilling to take it as a gift and cultivate it. Notwithstanding this, the inhabitants of that town are as intelligent, industrious, and moral, as those of any other district in the United States, and I firmly believe, as a whole, more free from debt. Indeed, I had an extensive acquaintance with the people of Mansfield, and I did not know a single silk grower who was not only free from debt, but in comfortable circumstances, with money at interest, &c., and this was wholly attributable to the profits of the silk business.

As I have already intimated, the silk culture in the district to which I have alluded was not prosecuted by corporations, or rich men, but by the ordinary and small farmer, and was with them a regular business. The trees, too, did not occupy any land worth mentioning, as they were planted along the public roads by the side of the fences, and were thus both an ornament and a means of profit.

I think the only thing required in the production of silk is to give the worms enough to eat, plenty of fresh air, and clean boards every week—the worms will do the rest.

Very respectfully yours, &c.

E. BADGER.

ON THE "DISTEMPER" OF CATTLE.—OATS SERVING TO ARREST THE PROGRESS OF CHINCH-BUG.

To the Editor of the Farmers' Register.

Charlotte, October 18*th*, 1839.

In the last number of your Register I am requested by Mr. W. I. Dupuy, and you join in the request, to communicate what knowledge I may have in relation to the disease among cattle, commonly called "distemper," or "Carolina distemper." I comply with the request, but am sorry I cannot give any valuable information on the subject. I know of no preventive or cure. I have lost many cattle by the disease, and used many prescriptions for its cure, without success. At one time, many years ago, I thought I had discovered a remedy, but subsequent experiments showed that it was not to be relied on. I presume my conversation about it has given rise to the apprehension that I am acquainted with a cure. At the time referred to, I had lost in one summer nearly half my cattle at one plantation by the disease, when, by falling, one of them broke off a horn, which the overseer discovered to be hollow. As he knew that boring into the horns was the best remedy for the disease commonly called "hollow horn," he had all the cattle gotten up, and bored the horns of all, except a large unmanageable bull. All were hollow, and none of the cattle died that season after the operation, except the bull. I then frequently spoke of the case, and advised boring the horns as a remedy or preventive of the disease. But subsequent trials both by myself and others, have shown that it is not to be relied on, though it has been thought sometimes efficacious. The general opinion in this part of the country is, that cathartics are the best remedy. But to produce an operation is the difficulty, as the contents of the maw, upon opening it after the death of the animal, are found to be perfectly dry. This difficulty to effect a passage has produced many prescriptions, of the superior virtue of which I am unable to judge. I have seen, not long since, and, as well as I recollect, in some number of the Farmers' Register, a strong decoction of the twigs and berries of the cedar tree highly recommended; but know of no instance of its trial.

Happily for this section of country, I believe the disease is leaving, or has actually left it. I heard of but few instances of it the two summers preceding the last, and I have heard of not one the last. For many years since my recollection it was unknown among us; and the general belief is that it came originally from Carolina, and hence the name Carolina distemper. It has been a long and destructive plague; but as it is not, if I may use the term, indigenous, it is to be hoped it may be a long time before it appears again.

The greatest plague we now have to complain of, is the chinch-bug. For several years past we have sustained great loss in our crops of wheat and Indian corn from their depredations, and we have cause to fear great mischief from them the next. It is, therefore, I use the occasion to communicate a statement of facts as related to me, and of which I do not doubt, from which it would seem that their ravages on Indian corn may be stayed after leaving a wheat field. A gentleman sowed a narrow strip of land in oats, (not with the design to protect his corn,) between a wheat and corn field, and the oats retarded the progress of the bug from the wheat to the corn so long, that although there were countless numbers in the former, very little injury was done to the corn. Now I account for the little injury in this way. Those who have paid attention to the subject know that there are, as is the case with many other insects, throughout the warm season, sucessive generations or crops of the chinch-bug, and that in certain stages or forms of existence they do little or no mischief, and that they are in a state to do much injury to the crop when they leave the wheat for the corn. The strip of oats then arrests them, and serves to nourish them until they have changed into another form, when they do little or no mischief, and in the mean time the corn is progressing and getting out of the way of injury. In confirmation of the facts stated and conclusions drawn, I will observe that I noticed in my own fields, that the bug after committing great depredations on a wheat field did but little injury, after it was cut, to an adjoining oat field, having penetrated it no where, as far as I observed, more than fifteen or twenty steps, before it was cut. If then a narrow intervening strip of oats will stay the progress of the bug from the wheat to the corn field, it will be well for all those who would otherwise have them necessarily adjoining, to interpose the narrow strip. Perhaps one of fifteen or twenty steps would answer, and do better if sowed late. We know that the corn fields adjoining the wheat are much the most subject to be injured.

W. M. WATKINS.

CORN CULTIVATED FOR THE STALK AND LEAF, AND NOT FOR THE GRAIN.

From the Southern Agriculturist.

Savannah, March 14*th*, 1839.

Mr. Editor,—The high price of labor is producing an important change in our system of agriculture. From our cotton plantations, the old treadle gin is disappearing, and an improved roller horse gin is supplying its place. Upon rice plantations, the thrashing machine, impelled by steam or animal power, is gradually expelling that remnant of barbarism, the flail stock. Although the high price of labor is matter of regret, its tendency is to make us better agriculturists. It calls for a greater sagacity, as well as a more rigid economy in the management of business. It makes us more saving of labor, and more careful of the health of the laborer. It leads to the adoption of labor-saving machines, and to the gradual substitution of animal power for human power.

The maintenance of the animals introduced by this change of system, is a practical question of great importance, and upon this point I propose to submit a few observations.

It is believed that the average crop of corn and oats in Georgia and South Carolina, does not exceed twelve bushels per acre. Upon this, and the fodder gathered from the corn, we place our dependence for the sustenance of the animals employed in our agriculture. To produce a sufficiency, we are compelled to enlarge our plantings of these exhausting crops, and we devote to these purposes land already impoverished and requiring rest. Among the ultimate consequences of such a system, are abandoned plantations, and emigration. To mitigate this evil, and to assist in the maintenance of our animals, I propose a fodder patch, that is, the cultivation of Indian corn expressly for the stalk, and not for the ear or blade. I propose this stalk fodder, not as a substitute for grain, but as a valuable auxiliary—rendering, in fact, the grain given more efficacious, and enabling the animals to do with less. For the last six years, I have devoted to this purpose a small lot of land, and I estimate the product so highly, that nothing would induce me to abandon the culture. At the usual corn planting season, this lot is trenched four feet apart, with a bull-tongue plough, and in these trenches we sow the common Indian corn, at the rate of two bushels and upwards to the acre. During its growth, this corn receives two or three ploughings, and this is all the culture it gets—it is neither hand-picked or hoed. At every ploughing, the earth is thrown fearlessly towards the corn, which would be buried and destroyed, were it not that the mass of plants, growing in the trenches, enables it to resist the pressure of the earth thrown against it. By this treatment, every particle of grass growing at the root of the corn is completely destroyed.

When the fodder corn begins to tassel, we begin to use it, and not before. The reason is manifest. It is a well known law of vegetable life that when plants are in bloom, then their mucilaginous, saccharine, and nutritive properties, are most fully developed. This is proven by the fact that if herbs be gathered for distillation, or grass be mown for hay, before the appearance of the blossom in both instances, they yield no valuable products. To this law Indian corn constitutes no exception, and hence our reason for waiting until it tassels before we commence using it. If gathered before that time, my persuasion is that the stalk is of little or no value.

We wait then until it tassels before we begin to use it. The ploughman, with a short scythe or sickle, cuts it up at the root, takes it by large armsfull to the cutting box, and when cut it is mixed with chopped oats, and given to our working animals. I feel satisfied, when a sufficiency of this chopped corn stalk is mixed with their oats, that plough horses and mules will do with one-third, perhaps one-half less grain. Besides, while using it, no other forage is required, and this is no trifling convenience. When planted at the usual season, the fodder corn begins to tassel about the 20th June. It comes in at a time when there is frequently a pressing necessity for fodder—when the ploughs are in full action—when animals require food of the most nutritive kind, and when frequently the blade crop of the preceding year is totally exhausted.

We continue to use this fodder corn as long as it lasts, and it has this great recommendation, that the longer it stands, until actually killed by frost, the more palatable it appears to become to animals. After the tassel has dried up, when every blade hangs down, and has become colorless, when in fact from external appearance, we would pronounce the plant actually dead, the stalk will be found to be still perfectly green. I have satisfied myself of this fact, by repeated observation. I have gone into this fodder patch for several years in succession, as late as the middle of October, and have invariably found the stalk of the corn green and more rich in its nutrive properties, than at any preceding period. The juices of the plant, after being elaborated in the leaves, appear to be concentrated in the stalk, and it contains at that time so much saccharine matter, that it approximates its taste to the upper joints of the sugar cane itself. That this protracted vitality of the stalk is owing to the fact, that the plant is never deprived of the blade, I have not a shadow of doubt. At the very time in October when I found the stalk of this fodder-corn green, crisp, and juicy, the stalks of the crop-corn from which the fodder had been gathered at the usual season, were dried up and dead. I infer from these facts, that the early gathering of fodder is a pernicious practice—because, by impairing the vitality of the stalk of the corn plant, when in the very act of perfecting the ear, it necessarily interferes with the complete maturity of the grain. I advance this as no novelty, but only to reiterate an important agricultural truth. It has been demonstrated by repeated experiments among the farmers of the middle and northern states, that "topping corn" seriously diminishes the amount of the crop. By parity of reason, the abstraction of the fodder before the maturity of the grain, must be attended with consequences proportionably injurious. It is the general impression of planters, that the ear of the Indian corn is completely matured at the time of gathering the fodder, and hence that no injury results from taking away the blade. I greatly doubt the correctness of this impression; Indian corn being an annual, the whole energies of the plant are directed to the perfection of the ear, all the other parts of the plant are but the ways and means provided for the accomplishment of this end. Now, it seems to me reasonable, and probable, that as long as the leaves and stalks remain green, they continue to impart something of value to the ear. The strong sympathies which are known to subsist between the ear, the stalk and the blade, go to confirm this opinion. If the green ear is destroyed by a squirrel, the leaves of that plant soon become discolored, and it prematurely dies. If the blades be stripped when the corn is in mutton, the stalk perishes, and the ear is shrivelled and light. You can mutilate no one part of the plant, without inflicting serious injury on the other two.

Could we abandon the gathering of fodder, we should in many respects be greatly the gainers.

The plant would escape mutilation, and consequently the ear would be completely perfected; the grain would be plump and heavy; would measure further, and fatten more. Besides, there would be the gain of time. There is no work done on plantations, which makes so poor a return for the labor expended. I have heard practical men say that a smart man will, with a scythe, cut a greater weight of hay in a day, than any five hands can gather in blades. As far as my experience goes, this falls short rather than exceeds the truth.

But the question is asked, what shall we use in lieu of blades. My answer is, we have more land capable of yielding hay than we imagine. Upon every plantation there are low grounds, shallow ponds, and patches of swamp, devoted commonly to rushes, brambles and gum sprouts, which, if drained, and ploughed, yield handsome crops of hay. Our ordinary high-lands produce tolerable crops of grass, if cow-penned and ploughed. Another resource is that of cutting the grass which springs upon our stubble lands, from which crops of small grain have been taken. Another source of supply would be this fodder-corn I am recommending. Two or three acres of good land appropriated to this purpose, would furnish a large supply of forage. The corn might be cut and stacked in the fields, as is the practice of the farmers of the middle and northern states, and this might be done at any time in September or October, as would best suit the convenience of the planter.

Fodder diligently gathered from these sources, would at least enable us to dispense with a part of the blade crop. The stripping might be postponed until the blades below the ear were dead. By that time, the grain would be so far matured, that it would suffer far less than happens when every blade is green at the time of gathering.

I have never yet ascertained the weight of an acre of fodder corn, but have no hesitation in saying that it is very great. One acre of good land will furnish an abundance of forage for four horses for three months. Mules appear to be especially fond of it, and cows running upon ordinary pastures, will, if fed with these chopped corn stalks, double the butter in a few days.

It is well known that the average crop of corn of the middle and northern states, exceeds our own, and that this arises not so much from superiority of soil, as from the number of stalks they are able to crowd upon an acre. With them, the corn plant does not attain a height of more than seven or eight feet, while with us it is not uncommon to see stalks fourteen feet in height. As a consequence, they are able to leave four stalks in a hill, when we leave only one, and hence their crops are larger than ours. In this climate, then, the tendency of Indian corn is to grow to stalk, rather than to ear, and by adopting the plan I propose for cultivating it expressly for the ear or blade, you take advantage of that propensity, and correct what may be termed an incumberance to valuable practical uses. If this immense growth of stalk militates against the production of grain, it is no small mitigation of the evil, if we can employ the stalk measurably as a substitute for grain.

A DISTINGUISHED FARMER OF NEW YORK.

Murray's Travels in North America.

From Canandaigua, which I left with much reluctance, we passed through a thriving and well cultivated country to Geneseo, where I had the pleasure of being introduced to Mr. W——, the owner of a magnificent estate in the Genesee flats. Fortune seemed not yet wearied of being bountiful, and allowed us to see this most beautiful valley, with the advantage of residing in one of the most hospitable and agreeable houses that I ever entered. Mr. W——'s son accompanied us through his extensive farms, which are formed to delight equally the eye of a Poussin or a Sir J. Sinclair. The broad meadows of an alluvial soil, covered with the richest grasses, as watered by the winding Genesee, are studded with trees, beautifully and negligently grouped, among which are scattered large herds of cattle of various breeds and kinds, both English and American; the meadows are here and there interspersed with fields of Indian corn and wheat, while the hills that rise on each side are crowned with timber, excepting spots where the enchroaching hand of improvement has begun to girdle some of the tall sons of the forest, whose scathed tops and black bare arms, betokening their approaching fall, give a picturesque variety to the scene.

Yet this scene, extraordinary and interesting as it was, possessed less interest to a contemplative and musing mind, than the venerable and excellent gentleman who had almost *created* it; for it was now forty-four years since Mr. W—— came as the first settler to this spot, with an axe on his shoulder, and slept the first night under a tree. After this, he lodged in a log-house; subsequently in a cottage; and he is now the universally esteemed and respected possessor of a demesne, which many of the proudest nobility of Europe might look upon with envy, where he exercises the rites of hospitality, in the midst of his amiable family, with a sincerity and kindness that I shall not easily forget.

[The subject of the foregoing well-deserved eulogy is James Wadsworth esq., one among our most esteemed subscribers and contributors. When thus presuming to name this distinguished farmer, we will add that his zeal for agricultural improvement, aided by the generous use of his wealth, in one remarkable instance at least, has been directed by patriotism and benevolence for the general good of the country. When Mr. Wadsworth had read our translation of Puvis' 'Essay on Lime,' which was prepared for and first appeared in the 3rd volume of the Farmers' Register, he duly appreciated the value of the work, and as much lamented the neglect of the subject in the great agricultural state of New York. He wrote to ask our permission to spread the essay among his countrymen by republication at his own expense, to be distributed gratuitously. Our exclusive right of authorship to the translation had not been guarded by patent, (nor desired to be,) though it was as much respected by the applicant; and we cheerfully and gladly granted what was so courteously asked. This nobly designed benefaction to agriculture was fully executed by the publication of a second edition of the essay, in a handsome form, under the direction of Professor James Renwick of Columbia College, and accompanied by an excellent general introduction from his pen, which was afterwards transferred to the pages of the Farmers' Register. What has been the effect of this gift, which was as unostentatious as it was patriotic and wise, we know not; but none other could have been better designed, or, if availed of, better calculated to promote agricultural improvement. It was the seed sown, which, if not utterly neglected and unnoticed, would grow to a crop yielding a return of ten thousand-fold.—ED. FAR. REG.]

SAGACITY OF THE LAND TORTOISE.

From the Hartford Courant.

Some time in June 1828, an animal known by that name was found in my garden, in the act of treating himself to green peas, small cucumbers and melons, and which we had attributed to the hens and chickens. Being unwilling to put him to death on the first conviction, a small hole was bored through the skirt of the upper shell, and a small cord of two or three yards in length, was attached to it, and he was tethered out in a convenient place a few rods distant from the vegetables, and marked on his breast plate, 'S. H. W. 1828.' The next day it was discovered that he had made his escape, having gnawed off his "tether string." A few days after this he was again detected in the same place of his former trespass, and to secure him from committing further depredations, a small ring of iron wire was linked into the hole of the shell, a more substantial cord attached to it, and the prisoner again placed upon his tether. This, however, proved insufficient for his safe keeping. The new cord was soon severed, and the vagrant, carrying off with him his iron ring and a small part of the cord, made a second escape. In June 1829, "Monsieur Tonson came again!" and was again detected in his old line of business. A trial for his crimes was instituted—the evidence against him was too clear to admit of doubt—he was found guilty—the number of pea pods, cucumbers and melons of different kinds which he had champed and ruined was ascertained as nearly as might be, whereupon the court, consisting principally of the females of the family, sentenced him to be immediately put to death by decapitation. But the the poor convict had one friend in the court; that friend exerted his influence, and finally obtained a commutation of the punishment from death to transportation, without limit of time. Pursuant to this order he was conveyed to a small pond about a quarter of a mile from the garden, the scene of his transgressions, but, not pleased with his accommodations among frogs and other creeping things soon found his way back to his old friends and their garden. He was then carried nearly half a mile in an opposite direction, and thrown into a small muddy brook, environed with bogs and sedgegrass.

In June 1832, who should appear but our old visitor again, with his mark and iron ring? What should now be done? The majority of the court denounced him an outlaw and utterly beyond the reach of mercy. His friend and advocate, however, urged in behalf of the convict that the sentence of transportation was *without limit of time*, and assured the court that if a convenient opportunity should offer he should send him next to Botany Bay—but if not, he would pledge himself to carry him to a place so distant that little fear could be entertained of his returning again to his old haunts. Upon these terms, a respite was obtained, and his sponsor caused him to be transported to Suffield, and there left in a grass field a little north of the meeting house. This expedient served that year, but in June 1833, we had the *pleasure* of another family visit from our old acquaintance. By this time, the resentment which had been felt toward him, had in a great measure subsided. He had become a sort of a pet and as we had a plentiful supply that year of cucumbers and other garden vegetables, he was allowed the whole range of the garden. But to fulfil my engagement as his surety, and as no opportunity offered to ship him off to Botany Bay, I wrapped him up in a piece of old carpet, so that he could have no means of noticing objects, carried him to Poquonoc, and threw him into a small stream in an alder swamp near Rainbow mills. But, "true as the needle to the pole," so he renewed his visit in 1835, but manifesting a desire to tarry with us longer than his company was agreeable, he was carried to and left in a brook near the foot of Turkey Hill Mountain. On the 20th instant he obliged us with other *call*, and, as I suppose, is yet in my garden.

He appears in fine health, plump and lusty, but has no discernable increase of size, nor appearance of advance in age, since my first acquaintance with him.

He yet wears his iron ring—the initials and date on his breastplate, though rendered somewhat obscure, by abrasion, are yet legible, and leave no possible doubt of his identity.

SAMUEL WOODRUFF.

Windsor, July 25th, 1839.

ESTIMATES OF ACTUAL MULBERRY AND SILK CULTURE.

From the Northampton (Mass.) Courier.

Mr. Atwell—Sir: If I can learn any thing from the communication of Dr. Graham, in your last number, it is that the silk growers have his entire sympathy and good will, and that it is in the present "mulberry speculation" that he has no confidence. I am glad it is no worse, and I propose to show that the doctor, and all others who have similar doubts, may safely enlarge their sympathies, till they embrace even the "sellers of trees." I will here observe, (and I beg that it may be particularly noted,) that all I may say in the present or future numbers on the subject of silk culture, that I shall never mention or take into consideration the profit on the sale of trees, but adhere strictly to the culture of silk, to add another most important staple to our agricultural productions. I fully agree with the doctor that "very many of those engaged in the growing of trees for sale, have no idea of engaging permanently in the culture of silk." There is no remedy for it but to overstock the market, and then it will cure itself; but it will be long ere the demand for mulberry trees will cease, if this is to be a silk growing country, (and I *know* it is to be) and some thousands of millions will be wanted. It is only for want of correct information on the subject that there is so much fear of the "wild speculation," and I propose to give a few facts that *should* satisfy the most incredulous, that one dollar each for trees, that can be freely propagated by cuttings, is not above their value for silk growing, and at that price they are within the reach of every farmer.

I shall only state facts, sir, and if I make any mistakes I hope to be corrected by any of your readers who may take an interest in the matter. I shall show by a regular account of Dr. and Cr. of what has been done the present season, and shall first state the case of a neighbor (a farmer) and then give one of my own:

Dr.—Oct. 1838. To cash paid for 200 mulberry trees, $1 each, - - -	$200
To cash for planting and hoeing cuttings for one acre, - - - - -	45
To cash for interest one year, - - - -	15
To cash for rent of land, - - -	20
	$280
Add cost of making 60 lbs. of silk (brought up) - - - - - - -	120
	$400
Cr.—By sale of 6000 lbs. leaves from 12,000 trees, the product of the 200 trees, at $1 per 100 lbs. the purchaser gathering the leaves, - - - - -	$60
12,000 trees on hand, average four feet high, equal in value for propagation to those purchased at one dollar, which will yield next season two pounds of leaves each tree, and cuttings for at least 200,000.	
I will not strike the balance to the above, but will only observe, that had the 6000 lbs. of leaves been fed to the worms instead of selling them, a much greater profit would have accrued; the first year the product would have been 60 lbs. of raw silk, at $6 per lb.; (cost carried up,) - - - - - - -	$360
Add state bounty, $1 50 per lb. - -	90
	$450

Can you believe the above account? It is true to the letter. Was the farmer mad, to engage in such an enterprise while *every body* said it was "all speculation?"

I will now state my own account, and for convenience will take 5 acres of my new farm of 80 acres, (most of which will be planted with mulberries next spring—20 acres of which are now filled with them, for permanent plantation.) You are aware, sir, that the above farm has been considered as worn out, and when I took it last autumn it was overrun with briers, and had not produced a crop for several years. I am thus particular, that our farmers may see the possibility of improving the poorest farm, and making it permanently productive of a much larger profit than I even dare to mention, but which they will readily perceive by the actual result of the first year, and the probable (and I may say certain) result of the next and following years.

The manure used for the above farm is such as is within reach of every farmer, but which has been much neglected, viz: *muck*, or the black vegetable matter found in swamps and bottoms at the foot of hills. It is the best and only *safe* manure for this climate; it causes a vigorous and healthy growth, and permanently improves the soil—while other manures, particularly barn or yard manure, causes a protracted growth, till severe frosts occur, which is death to the otherwise hardy tree. I have lost many hundreds of thousands in that way, and I would caution growers of the mulberry in our climate to beware of barn manure, but to prize every load of muck as the most valuable for safety and profit. It should be thrown out in the fall, to receive the action of frost, and be spread in the furrows or in the hill. Trees grown in it will withstand our hardest winters.

We will now see how the account stands with a part of the "Segur farm." I shall state the price of trees the same as the other farm. Those, however, were grown on better land.

Dr.—To cash paid for 5 acres of land, at $20 per acre, - - - - -	$100
To cash for 1000 trees, at $1 each, -	1000
To cash for carting 1000 loads of muck,	50
To cash for spreading same, - -	15
To cash for ploughing, planting and hoeing,	65
	$1230
Interest on $1230,	72
	$1302
Add account brought up,	1178
	$2480
The quantity of leaves is about the same as on the other lot, but as I chose not to use them this year, no account is made of it, but after stating the number of trees (50,000) we will carry it forward to the next year, and show 50,000 trees with one pound of leaves each (half the quantity) which fed to worms will make 500 lbs. of silk, at $6 per lb. - - -	$3000
Add state bounty, $1 50 per lb. - -	750
	$3750

Add to investment, interest to 1840,	$78	
" " Cocoonery,	60	
Making and reeling silk, at $2 per lb. - - - - - - -	1000	
Cultivation, - - - - -	40	
(Carried up)	$1178	
Deduct whole investment ($2480) and there is a profit over and above of		$1270

We thus have a profit of $1270 *over and above the whole investment and expenses*, with an increase of 500,000 trees, and cuttings enough for ten times that quantity if needed.

SAMUEL WHITMARSH.

Northampton, Sept. 28.

VARIETIES OF WHEAT.

From the Genesee Farmer.

At the first meeting of the English Agricultural Society, the first prize of twenty sovereigns, (or about 97 dollars,) was awarded to Col. Le Couteur for his account of the most approved varieties of wheat cultivated in England. Col. Le Couteur has doubtless paid more attention to wheat and made more accurate experiments in its cultivation, than any other person living, and his opinions are therefore entitled to great weight. We condense from the remarks of Lord Spencer, the President of the Society, a sketch of the favorite kinds, with some other particulars.

The first kind, or the one deemed the most valuable, was the Hoary White or Velveteen, from the chaff having a downy or velvet feel. This wheat after being repeatedly washed in brine that would float an egg or a potato was again washed in lime. The land was argillaceous, and had been well manured with dung, and prepared with the ashes of sea-weed and lime, in places that seemed to require such a dressing. The seed was sown on the 29th of January, two bushels per acre, and and was harvested the 16th of August. The average produce was 48 bushels. of 62 lbs. each. This produced of fine flour 2,402 lbs., pollard 126 lbs. and of bran 416 lbs. The estimated clear profit of an acre of this wheat was £15 6s. 9d.

The next variety in quality and value was the Jersey Dantzic, but known in different places by various names. This wheat has a smooth chaff, and is not liable to smut. It ripens a week earlier than the velveteen; but in a wet warm season is considered subject to rust. The produce of an acre of this wheat was 43½ bushels, with 480 lbs. of chaff, and 4,681 lbs. of straw. Eighteen pounds of the flour made a loaf of 25¾ lbs. weight, thus proving its value for making bread, as absorbing and combining with nearly one-half its weight of water. The average profit per acre of this wheat is estimated at £12 14s. 6d.

The third variety was the Whittington, which was sown in drills three inches apart, on land that had borne potatoes the previous year, subsequently to which it had been dressed with lime and seaweed ashes. The wheat was 29 days coming up, but the crop was abundant, the straw being generally six feet, and some of it seven feet in height. It ripens some ten days later than the Dantzic wheat, but does not degenerate. The average produce per acre was 33 bushels, with 483 lbs. of chaff, and 7,786 lbs. of straw; the latter being greater in amount than in any other species but one. There were obtained from one acre 1,454 pounds of flour, 477 lbs. of bran, and 47 lbs. of pollard. "The bread made from it is dark, but it keeps well for several days." The profits of this wheat per acre are estimated at £12 11s.

The fourth variety noticed was the Talavera Bellevue, sown on the 3d of February on a light rich loamy soil, 3 bushels per acre, in drills. The seed being very large an extra quantity is required. It is hardy, appearing above the ground in 25 days; and is no more subject to disease than the generality of white wheats. On account of the weight of the ear this wheat is liable to lodge, or be driven down by the wind. The produce was 52 bushels per acre, or 3,172 lbs. of grain, 282 lbs. of chaff, and 5,480 lbs. of straw. There were 2.485 lbs. flour, 38 lbs. of pollard, and 566 lbs. of bran. This wheat makes a fine white bread. The profits per acre was estimated at £16 1s.

Some other kinds were noticed, as the Golden Drop, very productive; the Common Prolific, a coarse wheat; and Brown's Prolific, a good wheat on soils suitable to its growth; but all, in the opinion of Col. Le C., yielding in value to the four first varieties named. From the amount stated as the average of the crops, it would not seem to exceed that of many fields in the Genesee country; though the general average in England is far greater than in the United States. Of the four varieties preferred, the Whittington, from which so much has been expected in this country, stands the lowest in the scale of productiveness. From what we had heard of the quality of the berry of this wheat, as exhibited in the species imported by Mr. Thorburn, we were not prepared to find it a wheat that would make 'dark bread,' which it seems is the fact. The incidental remarks on the time of sowing these wheats, and the period elapsing before vegetation, will explain in part the mistake into which the purchasers of the Whittington wheat have fallen in this country, in supposing it to be a spring wheat in one sense of the term. The English farmers sow wheat from September to April; and the wheats sown during the winter, as they do not vegetate or come forward till March, are called spring wheats, in distinction from those sown in September or October, and vegetating immediately. The spring wheats, properly so called, are there usually sown in April. The average temperature of Great Britain is much lower than with us, consequently grain of all kinds ripen more slowly, and the harvest is proportionably later than with us in the United States.

There can be no doubt that new and valuable varieties of wheat can be produced by skilful cultivation; and though it is not probable that all the most esteemed varieties in Great Britain would succeed well in this country, or prove as valuable in our climate as in theirs, still we think well of the efforts made to introduce the most approved kinds, and do not question that our farmers will find their interest in so doing. In all attempts to cultivate English wheat in this country, however, the difference between our seasons and theirs must be borne in mind, or the sowing will take place at improper times, and certain disappointment be the result to the cultivator.

EFFECT OF PUMPKIN SEEDS ON ANIMALS.

From the Maine Farmer.

Mr. Editor:—I have heard it remarked that if cows were fed with pumpkins freely, their milk was lessened in quantity, or thereby diminished. I doubted the fact; but if it was so I supposed that they produced flesh, or caused the animal to run to fat. A person near me observed that the fact did exist when the seeds were not removed, nor did they produce flesh as I had supposed. Said he, it is a known fact that pumpkin seeds have a very great effect on the urinary vessels. We all know that they are used medicinally for this purpose. And such is their power, that they cause such juices of the system unnaturally run to milk or flesh to pass off in a superabundance of urine. Therefore if you wish to realize benefit from pumpkins, (and they are very valuable, even beyond what they have been thought to be,) you must remove their seeds.

Still I doubted, because I knew that a pie made of pumpkin seeds was very good, and had no such bad effect. Now what man and animals are fond of to eat, if taken in suitable quantity, generally does not prove injurious. This I intimated to my friend, and observed that the seeds were not composed of much aqueous matter. He remarked that many things even in the form of dry powder had an operation on the glands, &c. to produce a flow of liquid matter.

Now, Doctor, tell us if the seeds must be removed when we feed our swine with pumpkins, for they are very fond of them, and I had thought they were very nutritive and productive of growth and flesh. If the flesh should be removed, we farmers ought to know it. I am aware that when the pumpkin seeds are made into a pie, their particles may be so changed by cooking that they will cease to have the bad effect named by my friend. If they are boiled with the pumpkins may not their nature be so changed as to render them beneficial, instead of deleterious?

A FARMER.

NOTE.—There is no doubt that the seeds of pumpkins are very diuretic and operate upon any animals, quadruped or biped, that take them into the stomach.

If cooked however, with the rest of the pumkins we have thought that they were less so than when given raw, and vastly more nourishing. We never knew any evil consequences arise from them when eaten by cattle or hogs, and we should not go to the trouble of removing the seeds when we wished to feed them out.—*Ed. M. Farmer.*

THE OKRA COTTON.

From the South Carolinian.

In your paper of the 13th ult., a writer calling himself "An Old Farmer," condemns the Okra cotton, which he raised from a quart of seed, which cost two dollars. He did not have Okra cotton seed, but a variety resembling it, and which should be called Twin, not Okra. There are two distinct varieties of Twin or Okra Cotton; some of the characteristics of each, I will point out. The one called *Okra* was discovered in Alabama, in first year's Petit Gulf seed. It grows up generally in one tall stalk—sometimes growing as high as 8 or 9 feet—with very short limbs, which are seldom more than 6 or 8 inches long, and having its bolls in clusters of two to seven, or more. I have seen ten blossoms or forms in one bunch. Sometimes, one, two or three long limbs put out near the ground, turn upwards, and grow parallel to the main stem, bearing fruit as it does.

The other variety, or *Twin* cotton, is said to have been discovered in Chester District. It is now somewhat like the Alabama Okra without being the same. It is about a half way plant, between the Okra and Petit Gulf. I have never seen it taller than 4 or 5 feet. Its limbs, are longer than the Okra, and not as long as the Petit Gulf. Both kinds have twin bolls; but the bolls and blossoms are more numerous in the Okra. Two bolls on the same stem, are frequent in both; but is only on the okra, that I have seen three blossoms within the same calyx, or four, five, or more bolls, in one cluster.

There is also a clearly defined difference in the Chester *Twin*, a darker, green, and more naked seed. No person who has once seen the two plants growing, or the two kinds of seed, will ever mistake the one for the other.

The price paid, is also an evidence that "An Old Farmer" did not get *Okra* cotton seed: none were *ever* sold in Alabama, under five dollars a quart; and in this state the price was 50 cents a seed.

I am not prepared to say, that the Chester kind is not a good cotton. I know too little of it. The staple is good: I have seen some stalks, in gardens, very well filled with bolls; my only object now, is to correct an evident mistake of "An Old Farmer."

To the Alabama Okra there is one objection, which I think can be easily obviated: It grows too tall, and is liable to fall down. The remedy, is to top it, at 4½ or 4 feet. The stalk grows stronger, the bolls fill up larger, and the product is increased by it. As it will bear great crowding on the land, the yield will be greater than from Petit Gulf. It is, in fact, an improved Petit Gulf seed.

A YOUNG PLANTER.

CURIOUS EXTRACTS FROM FULLER'S 'WORTHIES OF ENGLAND,' (1662).

Wonders.—"At Fishtoft, in this county, no rats or mice are found, so that barns built, *party per pale*, partly in this and the next parish, on one side are annoyed, on the other side (being Fishtoft moitey) are secured from vermin. Surely no piper (what is notoriously known of Hamell in Westphalia) did ever give them this *mice-delivery* by his musick.

"It is easier to conjure up many, than to allay one difficulty; other places in England affording the like. At one of the Redings in Essex, no hogs will root. In another common, no mole will cast. In Lindley, in Leicestershire, no snakes are found. I believe they over-shoot the mark, who make it a *miracle*; they under-shoot it who make it majick; they come nearest to truth who impute it to occult qualities.—"

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Rabits of Norfolk.—"These are an army of small pioneers, whence men have learned *cuniculos agere*, the art of undermining. They thrive best in barren ground, and grow fattest in the hardest frosts. Their flesh is fine and wholesome."

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"*Pigeons.* These of all fowls live most sociably in a common-wealth together, seeing their government is not, as bees, monarchical. They are generally reported without gall; understand it, their gall is not sequestred into a distinct vessel, as in other creatures. Otherwise we find the effects thereof in their animosities among themselves (whose bills can peck as well as kiss) as also (if their crops be not clearly drawn) in the bitterness of their flesh. They are most swift in flight, and the steerage of their tails conduceth much to their steddy mounting upright. An envious man, having caught his neighbour's pigeons in a net, feeding on his stack, pluck'd off their tails, and let them go; which, though they could fly forward home, yet were soon after found dead in the dove-cote, famished for want of food, as unable to fly up perpendicularly, and so out at the lever.

"Pigeons, against their wills, keep one lent for seven weeks in the year, betwixt the going out of the old, and growing up of the new grain. Probably, our English would be found as docible and ingenious as the Turkish pigeons, which carry letters from Aleppo to Babilon, if trained up accordingly. But such practices, by these wing-posts, would spoil many a foot-post [*], living honestly by that painful vocation.

"I find a grevious indictment drawn up against the poor pigeons for felony, as the grand plunderers of grain in this land. My author, computing six and twenty thousand dove-houses in England and Wales [†], and allowing five hundred pair in each house, four bushels yearly for each pair, hath mounted the annual wast they make to an incredible sum. And, if the moiety of his proportions hold true, doves may be accounted the causers of death, and justly answer their etymology in hebrew; Jonah, which is deduced from a root, signifying to spoil or to destroy. The advocates for pigeons plead, that they pick up such loose corn which otherwise would be lost, and uselesly troden into the earth; that probably divine providence, which feedeth the fowls, by some natural instinct directeth them to such grain which would be barren and fruitless; that their dung, incredibly fruitful for the manuring of ground, abundantly recompenseth the spoil done by them.

"However, if pigeons be guilty of so great stealth, they satisfy the law for the same, being generally kill'd for man's meat; and a corrected pigeon (let blood under both wings) is both pleasant and wholesome nourishment."

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"*The great storm in Somerset-shire.* May He, who bindeth the sea in a girdle of sand, confine it within the proper limits thereof, that Somerset-shire may never see that sad accident return, which hap'ned here 1607; when, by the irruption of the Seavern-sea, much mischief was, more had been done, if the west-wind had continued longer with the like violence. The country was overflown, almost twenty miles in length, and four in breadth, and yet but eighty persons drowned therein. It was then observable that creatures of contrary natures, dogs, hares, foxes, conies, cats, mice, getting up to the top of some hills, dispensed at that time with their antipathies, remaining peaceably together, without sign of fear or violence one towards another; to lesson men in publick dangers, to depose private differences, and prefer their safety before their revenge."

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"*Bristol diamonds.* These are the stars of the earth, though such but dimme ones, which St. Vincent's rock near to this City [Bristol] doth produce. Their price is abated by their paleness and softnesse, to which we may add their number and nearness; for, were they but few and far-fetched, their value would be advanced. They are not those unions, pearles so called, because thrifty nature only affordeth them by one and one [*]; seeing that not only twins, but bunches and clusters of these are found together.

Were this rock of raw diamonds removed into the East-Indies, and placed where the beams of the sun might sufficiently concoct them; probably in some hundreds of years they would be ripened into an orient perfection. All I will add is this; a lady in the reign of Queen Elizabeth would have as patiently digested the lye, as the wearing of false stones or pendants of counterfeit pearl, so common in our age; and I could wish it were the worst pieces of hypocrisy in fashion."

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"*Lampreys.* "In Latine *lampetra à lambendo petras*, "from licking the rocks," are plentifull in this and the neighbouring counties in the river of Severn. A deformed fish, which, for the many holes therein, one would conceive nature intended it rather for an instrument of musick then for man's food. The best manner of dressing whereof, saith my author [†], is "to kill it in malmesey, close the mouth thereof with a nutmegg, the holes with so many cloves; and when it is rolled up round, putting in thereto filbard-nut-kernells stamped, crums of bread, oyle, spices, &c." Others (but those miso-lampreys) doe adde, that, after all this cost, even cast them away, seeing money is better lost then health; and the meat will rather be delicious then wholesome, the eating whereof cost King Henry the First his life [‡]. But by their favour, that king did not dye of lampreys, but of excess in eating them; and I am confident the Jews might surfet of manna itself, if eating thereof above due proportion.

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Lime. "I am credibly informed that, within few miles of Pontfract, no less than twenty thousand pounds worth of this coarse commodity is yearly made, and vended in the vicinage. It is a great fertilizer of ground, if judiciously disposed of. Indeed the laying of lime on light and sandy ground (like the giving hot cordials to persons in high feavourous, enough to drive them into a frenzy) will soon burn out the heart thereof; which bestowed on cold and chill ground, brings it to a fruitfull consistency, and, prudently ordered, it will for a long time retain the same.

ORCHARD GRASS.

From the Western Farmer.

The cock's foot grass (Dactylis glomerata. L.) is known in America by the name of orchard grass, is an imperfect perennial, and grows naturally on dry sandy soil. It is a native of the United States. This grass may be known by its coarse appearance, both of the leaf and spike; and also by its whitish green hue. It is probably better adapted than any other to sow with clover, on lands intended for pasture. Its good properties consist in the early and rapid growth, and its resistance of the drought; but all agree, that to obtain its greatest value, it should be kept closely cropped. Sheep will pass over every other grass to feed upon it. If suffered to grow without being cropped, it becomes coarse and harsh. Col. Powel, of Pennsylvania, after cultivating it ten years, declares it produces more pasturage than any artificial grass he has ever seen in America. After being fed very close it has been found to afford good pasturage, after remaining five days at rest. It is suitable to all arable soils. It abounds in seeds, which are easily gathered; but on account of its peculiar lightness, (the bushel weighing from 12 to 14 lbs.) the seed should be spread on a floor, and sprinkled with water a day or two before it is sown, that it may swell and more readily vegetate. Two bushels of seed are sown to the acre, or half this quantity with clover. The orchard grass should be cut early, except intended for seed, as it diminishes two-sevenths in value as hay, by being permitted to ripen its seeds. It will bear cutting as early as clover, and the latter swath is very abundant. After preparing the seed for sowing, to mix plaster of Paris is recommended. It is one of the most profitable grasses, and much of its success depends upon the manner of sowing.

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[*] Dr. Fuller never dreamt of the despatch made by mail coaches. N.

[†] Samuel Hartlib, of husbandry, his legacy, p. 227.

[*] *Uniones*, quia nulli duo simul reperientur." Pliny's Natural history, lib. IX. cap. 35.

[†] Camden's Britannia, in Worcestershire.

[‡] Stow's Chronicle, p. 142.

We noticed a few days since a small lot of this grass sown the last spring, a part of it had been cut and fed to cattle. Where it had been cut it was coming out again, and promises to make another crop in good time. It will be recollected by those who observed it last season, that the orchard grass stood the drought better than any other; from what we have seen we are disposed to recommend it to our farming friends; but we would sow in land made rich with manure, in preference to any other, if we expected to reap immediate benefit.

For the Farmers' Register.

FIRST VIEWS WHICH LED TO MARLING IN PRINCE GEORGE COUNTY.

By the Editor.

Among the persons who have read with interest the 'Essay on Calcareous Manures,' and have received as sound the novel theory and doctrines there maintained, several have expressed their curiosity which had been excited to learn the earliest facts, or the train of reasoning, which led to the imputed cause of the defect of naturally barren soils, and the remedy. Such inquiries have been made of the writer by persons of investigating and well informed minds, but of very different education and pursuits; and they were all pleased to say, in regard to the concise verbal answers made to their inquiries, that they deemed the details likely to be interesting to many, and that if given to the public, they might serve better to induce the consideration and enforcement of the doctrines, than had been done by the mere arguments which had been already published, convincing as they considered the arguments to be.

Though, without these reasons and solicitations, the writer might have still refrained from touching this subject, it was not that he had not held the same opinion—and, except in his own case, would have urged the same course. It is certain, that the tracing of the steps by which any new discovery, or improvement, is reached, must always be interesting in proportion to the admitted importance of the results; and indeed such a statement seems almost necessary to induce the reader to accompany the author from his first premises to the remote conclusion, and which otherwise is only reached through a devious and tedious passage, and by a course of reasoning which is wanting in interest, because the application and tendency of the arguments and proofs are not seen when they are first presented. The objection which restrained the writer from before pursuing a course which he would have highly approved in others, was, that such a narrative of opinions and facts would be indeed a personal narrative, and therefore obnoxious to the charge of egotism throughout. The statement of the reasoning which led to the successful use of fossil shells on the poor lands of lower Virginia, would be incomplete if not accompanied by a narrative of early labors, and the early as well as latest results and effects. In the whole of this, there would be scarcely any thing but statements of what the writer thought, and reasoned, and performed. But the subject must be so treated, or not at all; and having consented to give the narrative, the writer will throw aside all scruples and objections, and endeavor to enter as much into detail, as he, if a reader of others' agricultural improvements and practical operations, would desire to find.

With the beginning of the year 1813, when barely nineteen years of age, the easy indulgence of my guardian gave to me the possession and direction of my property; which consisted of the Coggin's Point farm, with the necessary and yet very insufficient stock of every kind. It is scarcely necessary to add that, at my very early commencement, I was totally ignorant of practical agriculture; and such would have been the case, according to the then and now usual want of training of farmers of Virginia, even if my farming labors had been postponed to a mature age. But I had always been fond of reading for amusement, and the few books on agriculture which I had met with had been studied, merely for the pleasure they afforded, at a still earlier time of my boyhood. The earliest known of these works was an English book, in four volumes, the 'Complete Body of Husbandry,' of which I have not seen the only known copy since I was fifteen years old. This work was probably a mere compilation, and of little value or authority; but it gave me a fondness for agricultural studies, and filled my head with notions which were, even if proper in England, totally unsuitable to this country. 'Bordley's Husbandry' next fell into my hands, and its contents were as greedily devoured. This was indeed written in America, and by an American cultivator; but as he drew almost all his notions from English writers, his work is essentially also of foreign materials.

Thus prepared, I commenced farming, ignorant indeed, but not in my own conceit. The agriculture of my neighborhood, like all that I had ever witnessed, was wretched in execution, and as erroneous as well could be in system, whether subjected to the test of sound doctrine, or the improper notions which I had formed from English writers. I was right in condemning the general practice of my neighbors—but decidedly mistaken in my self-satisfied estimate of my own better information and plans.

Just about the time that my business as a cultivator was commenced, Col. John Taylor's 'Arator' was published; and never has any book on agriculture been received with so much enthusiastic applause, nor has any other had such wide-spread early effects in affecting opinion, and stimulating to exertion and improvement. The ground had before no occupant, and therefore this work had to contend with no rival. The larger land-owners, of lower Virginia especially, had previously treated their own proper employment, and their only source of income, with total neglect; and very few country gentlemen took any personal and regular direction of their farming operations. It was considered enough for them to hire overseers, (and that class then was greatly inferior in grade and respectability to what it is now,) and to leave the daily superintendence to them entirely. The agricultural practices, and also the products, were consequently, and almost universally, at a very low ebb. The work of Taylor appeared when these evils had become manifest; and it was received with a welcome which in warmth was proportioned to the magnitude of the evil, and to the exaggeration of the promises of speedy and effectual remedy which the author made, with so much good faith no doubt, but which proved any thing but true to the great majority of his sanguine followers.

Of course, I was among the most enthusiastic admirers of 'Arator;' and not only received as sound and true every opinion and precept, but even went beyond the author's intention, (perhaps,) and applied his rules for tillage to lands of surface and soil altogether different from the level and originally rich sandy soils of the Rappahannock, where his labors and system had been so successful. However, this error was by no means confined to myself; for his other disciples fully as much misunderstood the directions, and misapplied the practices.

It was my main object to enrich my then very poor land; and, for that, Taylor offered means that seemed to be sure and speedy. According to his views, it was only necessary to protect the arable land from all grazing, and thus let the vegetable cover of the land, when resting, serve as manure—to plough deep, and in ridges—to convert all the cornstalks and other offal to manure, and plough it under, unrotted, for the corn—to put the farm under clover, as fast as manured—and the result would be sure. I hoped at first to be able to manure, say 10 to 15 acres a year, very heavily, with the barn-yard manure, and expected that such manuring would give a crop of 50 bushels of corn to the acre. The spaces so enriched, when in the succeeding crop of wheat, would be laid under clover—and its acquired productiveness be made permanent, by the lenient rotation of two crops only taken from the land in four years. But utter disappointment followed. The manure was put on the poorest (and naturally poor) land; and it produced very little of the expected effect in the first course of crops, and was scarcely to be perceived on the second. Clover could not be made to live on land of this kind; and even on much better, or where more enriched, was a very precarious crop, and which, where the growth was best, certainly yielded the entire occupancy of the ground to natural weeds after one year. The general non-grazing of the fields under grass, or rather under weeds, produced no visible enriching effect, and the ploughing of hilly land (as mine mostly was,) into ridges, caused the most destructive washing away of the soil by heavy rains. These results were not speedily made manifest; and before being convinced of their certainty, I had labored for four or five years in using these means of supposed improvement of the soil, but all of which proved either profitless, entirely useless, or absolutely, and in some cases greatly injurious. And even after trying to avoid the first known errors, and using all other supposed means for giving durable and increasing fertility to my worn and poor fields, at the end of six years, instead of having already achieved great improvement, I was compelled to confess that no part of my poor land was more productive than when my labors commenced, and that on much of it, a tenfold increase had been made of the previously large space of galled and gullied hill-sides and slopes.

When more correct opinions had been formed in after time of the actual condition and requirements of such poor soils, it seemed an astonishing delusion that would have been altogether ludicrous but for its serious effects, that I should have counted on so much improving such a soil, and by such means. With the exception of a small part near the river banks, (perhaps one-fifth of the then cleared and cultivated land,) which had been originally of very fine quality, and, however abused and exhausted, was still good land, the farm generally consisted of a soil of sandy loam, usually about three inches deep, and through which a single-horse plough could easily penetrate and turn up the barren and more sandy subsoil. Grazing the fields, when not under tillage, had been the practice, and under it, very little growth was to be seen except the light and diminutive "hen's-nest grass," which formed the almost universal cover of the poor fields of lower Virginia, in the intervals between tillage. Add to these circumstances of very poor and shallow soil, and barren and sandy subsoil, and almost no vegetable cover to turn under, that every field was more or less hilly, and liable to be washed by heavy rains—and the judicious reader will see nothing but false confidence and ignorance displayed in my bold adoption of Taylor's system. Nor was I convinced of my error until after nearly all the fields had been successively thrown into ridges by two-horse ploughs, and all the hilly and more slightly inclined surface had been awfully washed and gullied, by the exposure of the loose subsoil to the action of the streams of rain-water.

While these my supposed measures of improvement were in progress, I was in habits of frequent and familiar intercourse with my oldest and best friend, and former guardian, Thomas Cocke, who resided then on his Aberdeen farm, and since and now on Tarbay, adjoining my own land. My friend was a man for whose mind and mental cultivation I could not but entertain a very high estimation. But, though all his life a practical and assiduous cultivator, and finding his greatest pleasure in his farming labors, he yet was a careless, slovenly, and bad manager, and of course an unprofitable farmer. Therefore, on this subject I held in but light esteem the opinions which he held opposed to my own. *One of these,* (and which he had first gathered from some old and ignorant, but experienced practical cultivators of his neighborhood,) was the opinion that our land which was naturally poor could not "hold manure," to any extent or profit, and therefore could not be enriched. For years I heard this opinion frequently expressed by him, and the evident inference therefrom, that the far greater part of our lands, and of the whole country, was doomed to hopeless sterility; and, as often as heard, I rejected it as a monstrous agricultural heresy—as treason, indeed, to the authority of Taylor, and of every other author on agriculture whom I had read or heard of. But at last, I was compelled, most reluctantly, to concur in this opinion.

What was then to be done? I could not bear the idea of pursuing the general system of the country in continuing to lessen the already small productiveness of my fields, by their course of cultivation. The whole income, and more, was required for the most economical support of a then small but fast growing family; and for any increase of income or net profit, there was no hope, save in the universal approved resort, in all such cases, of emigrating to the rich western wilderness. And accordingly such became my intention, fully considered and decided upon, and which was only prevented being carried into effect by after occurrences.

Just before this time Davy's 'Agricultural Chemistry' had been published in this country; and I read it with delight, notwithstanding my then total ignorance of chemical science, and even of chemical names, except as learned by its perusal. There was one passage in this author which seemed to promise to afford both light and hope on the point in which disappointment had led me to despair. As an illustration of defects in the chemical constitution of soils, and of the remedies which proper investigation might point out, he adduced the fact of a soil "of good apparent texture;" which was steril, and seemed incapable of being enriched. The fact which struck so forcibly on my mind was presented in the following concise passage of Lect. iv. "If on washing [for analyzing] a steril soil, it is found to contain the salt of iron, or any acid matter, it may be ameliorated by the application of quick-lime. A soil of good apparent texture from Lincolnshire, was put into my hands by Sir Joseph Banks as remarkable for sterility. On examining it, I found that it contained sulphate of iron; and I offered the obvious remedy of top-dressing with lime, which converts the sulphate into a manure."

Much the greater part of my land, and of all the land of lower Virginia, seemed to me just such as Davy described in this single and peculiar soil. It was certainly of "good apparent texture," that is, it was neither too clayey or too sandy, nor had it any other apparent defect to forbid its being fertile in a very high degree. Yet it was and had always been steril, and, as my experience concurred with that of my older friend in showing, it could not be either durably or profitably enriched by putrescent manures. Could it be possible that the sulphate of iron (copperas) which Davy found in this soil, and which he evidently spoke of as a rare example of peculiar constitution, could exist in nineteen-twentieths of all the lands of lower Virginia? This could scarcely be; and yet, in despair of finding other causes, I set about searching for this one.

It was not difficult, even for a reader so little instructed in chemistry, to apply the test for copperas. It was only necessary to let a specimen of the suspected soil remain soaking in pure water, until any copperas, if present, would be dissolved; then to separate the fluid by pouring off and filtration, and then to add to the fluid some of the infusion of nut-galls. If copperas had been held in solution, the mixture would produce a true *ink*, of which the smallest proportion would be made visible in the before perfectly transparent water. But all these first attempts were fruitless, and I was obliged to conclude that the great defect, or impediment to improvement, in most of our soils, was *not* the presence of the salts of iron. But though not a salt, of which one of the component parts was an acid, might not the poisonous quality be a *pure* or *uncombined acid?* This question was raised in my mind, and the readiness produced to suppose the affirmative to be true, from several circumstances. These were, 1st, that certain plants known to contain acid, as sheep-sorrel and pine, preferred these soils, and indeed were almost confined to them, and grew there with luxuriance and vigor proportioned to the unfitness of the land for producing cultivated crops. 2nd. That of all the soils supposed to be acid which I examined by chemical tests, not one contained any calcareous earth.* 3rd. That the small proportion of my land, and of all within the range of my observation, which was *shelly*, and of course calcareous, was entirely free from pine and sorrel; and moreover was as remarkable for great and lasting fertility, as the lands supposed to be acid, for the reverse qualities. Shells, or lime, would necessarily combine with, and destroy all the previous properties of any acid placed in contact; and therefore, if present universally, and always acting as a poison to cultivated plants, it seemed plain enough why the shelly lands were free from this bad quality, and by its absence had been permitted to grow rich, and to continue productive. Every new observation served to add strength to this notion; and in our tide-water region generally, and even in my own neighborhood, there were plenty of subjects for observation and comparison, both in small shelly and fertile spots, and a vast extent of poor pine and sorrel-producing lands. Still, I could obtain no direct evidence of the presence of acid, either free or combined, by applying chemical tests to soils, (as was tried in many cases,) nor was there any authority in my oracle, Davy's 'Agricultural Chemistry,' nor in any other work which I had read, for supposing *vegetable acid* to be present in any soil. Though Davy adds to the supposition of the presence of the "salt of iron," "or any acid matter," it is clear from the whole context that he had in view the possible and extremely rare presence of a *mineral* acid (as the sulphuric;) and not *vegetable* acid, which my views required, and my proofs were afterwards brought to maintain. Sulphuric acid is sometimes found in certain clays, and in combination with iron is also in peat soils; but these facts have no application to ordinary soils of any country. Of course, this absence of authority would, to most inquirers, have seemed fatal to the position of an acid principle being *generally* present in the soils of Virginia, and in great quantity and power of injurious action. This was, indeed, a great obstacle opposed to the establishment of my newly-formed opinion; but it was not yielded to as insuperable. Diffident as I then was of any such views of my own, and holding the dicta of Davy as the highest authority, and even his omission of any position as evidence that it was untrue, or unknown, still I was not daunted, and supposed it possible that the soils of this country might vary essentially in composition, in this respect, from those of England; or *barely possible* that even the great chemical philosopher might not have observed the presence of vegetable acid in the comparatively few cases of its existence in English soils. The later observations of subsequent years added much to my evidences of the existence of acid in soils; and still later and scientific investigations of chemists have served to establish that there *is* an acid principle in most soils, in the *humic* or *geic acid*. But these discoveries of chemists had not been published in 1817, (if indeed known to any) nor had my own observations reached to all the proofs which I afterwards (in 1832) published in the first edition of the 'Essay on Calcareous Manures,' and which were still in advance of the now generally received opinions of the geic or humic acid. It must therefore be confessed, that if I reached a correct conclusion, it was not on sufficiently established premises, and known chemical facts. However, reached it was, whether by right or wrong reasoning; and however little supported by direct proof or authority, I was almost sure, in advance of any known experiment, first, that the cause of the unproductiveness and unfitness for being enriched of most of our lands, was the presence of acid, and secondly, and consequently, that the application of lime, or calcareous earth, would, by taking up and destroying the poisonous principle, leave the soil free to receive and to profit by enriching manures.

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* I was not then aware, of the important and novel fact which I afterwards ascertained and established, and now fully received (with very slight acknowledgement of its source) by the geologists of this country, that *almost all the soils* on the Atlantic slope of this country, and even including nearly all limestone soils, are also entirely destitute of *carbonate* of lime, though that ingredient seems universal in all the good soils of England, and the continent of Europe.

But even if this theoretical position had been demonstrated, still it might furnish no *profitable* practical remedy. For admitting that the application of calcareous matters would relieve the soil of its great evil, and make it capable of receiving subsequent improvement, yet after being so relieved, the land, I supposed, would be still as poor as before, and would require all the manure, labor and time necessary to enrich any very poor soil; and these might be so expensive, that the improvement of the land would cost more than it would afterwards be worth. These considerations served to lessen my estimation of the utility of the theoretical truth, and to make my earliest applications of the theory to practice hesitating, and very limited in extent.

Having settled that calcareous matter was the medicine to be applied to the diseased or illy constituted soil, I was luckily at no loss to find the materials. In some of the many ravines which passed through my land, and on sundry parts of the river bank, were exposed some portions of the beds of fossil shells, which underlie nearly all the eastern parts of Virginia and several other southern states; the deposite which then had obtained in this region, though unproperly, and still retains, the name of *marl*. I began operations in February 1818, at one of the spots most accessible to a cart. The overlying earth was thrown off, and a few feet in width of the marl exposed, in which a pit was sunk to the depth of but three or four feet. When night stopped the digging and throwing out of the marl, the slowly oozing water filled the pit; and as no proper plan of draining had been adopted, the first shallow pit was abandoned, and another opened. In this laborious and wasteful manner there was as much marl obtained as I was then willing to apply. It served to give a covering of 125 to 200 bushels per acre, to 2½ acres of new-ground. The wood on the land had been cut down three years before, and suffered to lie and rot until cleared up for cultivation in 1818. Though poor ridge land, and of what I deemed of the most acid class of soils, still the previous treatment had given to it so much decomposed vegetable matter, that its product would necessarily be made the best of which such a soil was capable of bringing. And because of the superabundance of food for plants then ready to act, this was not a good subject to show the earliest and greatest benefit of neutralizing the acid. However—notwithstanding this circumstance, and the small amount and poverty of the marl, (which contained but one-third of calcareous matter,) the improvement produced was greater and more speedy in showing than I had dared to count on. When the plants were but a few inches high, and before I had hoped to see the slightest improvement, (indeed none had been expected to show in the first year,) the superiority of the marled corn was manifest, and which continued to increase as the growth advanced. My high gratification can only be appreciated by a schemer and projector—but such a one can well imagine my feelings and sympathise in my triumph. The increase of the first crop, corn, I stated, by guess, in reporting the experiment, to be fully 40 per cent., and that of the wheat which succeeded was much greater. Subsequent measurements of other products of experiments induced me to believe I had under-rated the amount of increase in this first application. (This experiment is the first stated, and at length, at page 37 of 'Essay on Calcareous Manures' 2nd Edition.)

Great as had been the labor of this application, and small its increased product, (comparing both with later operations,) the results served to completely sustain my theoretical views, and also, showed the remedy for the general evil to be far more quick, and more profitable, than I had dared to count on. Another person would probably have despised this small increase to the acre, and supposing the effect to be but *temporary*; and this all would have inferred, whether judging by comparison with all other manures known in practice, or even if by the authority of books. For the best informed of the old writers (even Lord Kaimes, for example,) while claiming for the effects of marl great durability, still consider that at some period, say 20 or 100 years, the effects are to cease. But my views were not *limited* within any practical experience, or authority, but by my own theory of the action; and that theory taught me to infer that the benefit gained *would never be* lost, and that, under proper cultivation, the increase of product would still more increase, instead of being lessened in the course of time. In thus fully confiding in the permanency of the improvement, I was at once convinced of the operation being both cheap and profitable. All doubt and hesitation were thrown aside, and I determined to increase my labors in marling to the utmost extent of my views. Still the want of spare labor, and the established routine of farm operations which occupied all the force, retarded my operations so much that no more than 12 more acres (for the next year's crop) were marled in that year.

It forms an essential part of the character of an enthusiastic and successful projector, and especially an agricultural projector, to be as anxious to inform others as to profit himself. Of course I tried to bestow upon, and share my lights with, all my neighbors and other farmers whom my secluded life permitted me to meet. This disposition also caused my earliest attempt at writing for even so small a portion of the public as constituted a little agricultural society which I had induced to be established in my neighborhood. To show my earliest opinions and statements on this subject, I will here quote the material part of a communication made to that society, and which was written in October of the year of my first experiment. I copy the extract just as it then stood, and with all its defects of form and of substance. I then shrunk in fear from the greater publicity which the press would have afforded, and had not the remotest anticipation that my first effort, then made, would lead me to the extent of intercourse since established and maintained with the public, both by writing and printing.

"We should be induced to infer from the remarks of those writers who have treated on the improvement of land, that a soil artificially enriched is equally valuable with one which would produce the same amount of crop from its natural fertility; and that a soil originally good, but impoverished by injudicious cultivation, is no better than if it never had been rich. If this conclusion be just (and the contrary has not been even hinted by them) it is in direct contradiction to the opinion of many intelligent practical farmers, with whom my own observations concur, in pronouncing that soils naturally rich, (although completely worn out,) will sooner recover by rest—can be enriched with less manure—and will longer resist the effects of the severest course of cropping, than soils of as good apparent texture and constitution, and in similar situations, but poor before they were brought into cultivation. Should the latter opinion be correct, it is of the utmost importance that the subject should be investigated; as the only conclusion that can be drawn from it, is, that such land must have some secret defect in its constitution, some principle adverse to improvement; and until this is discovered and corrected, it is an almost hopeless undertaking to make a barren country permanently fertile, by means of animal and vegetable manure.

"That *inclosing* has but little effect in improving land naturally barren, is sufficiently proved by poor wood-land. This has had the benefit of inclosing for, perhaps, thousands of years, and is yet miserably poor. It may be said that leaves are not to be compared in value to grass or weeds; but surely leaves ought to improve as much in a thousand years, as grass or weeds in twenty. Besides, it is well known, that leaves taken from this very land, and applied elsewhere, have produced much benefit; and the advocates of inclosing must agree with me in ascribing to this cause, the natural fertility of the most valuable land.

"As to manure, these are but few farmers who have not, like me, experienced complete disappointment in endeavoring to improve land so little favored by nature. In the usual method of summer manuring, by moveable cow-pens, the most negligent farmers give the heaviest covering, by suffering their pens to remain stationary sometimes six or eight weeks. I have known the surface in this manner to be covered an inch thick with the richest of manures, and yet, after going through the same course of crops and grazing with the adjoining unmanured land for six years, could not be distinguished. * * * * *

"If any one principle should be always found in one kind of soil, and as invariably absent in the other, we might reasonably infer that *that* was the cause of fertility or barrenness. Judging from my very limited observations, it appears evident that calcareous earth constitutes a part of every soil rich in its natural state, and that whenever a soil is entirely or nearly deficient, it never can become rich of itself, and if made so by heavy doses of dung, will soon relapse into its former sterility.

"Let us observe how facts coincide with this opinion. The lower part of Virginia is generally poor; narrow stripes along the rivers and smaller water courses are nearly all the high lands that are valuable, and in this class, exclusively, shells are seen so frequently, and in such abundance, that it seems highly probable that they are universally present, but so finely divided as not to be visible. When we know the change produced by calcareous earth in the color and texture of soil, and in a field of an hundred acres, all of the same dark colored mellow soil, shells may be seen in only a few detached spots, yet we cannot but attribute the same effects to the same cause, and allow calcareous matter to be present in every part.

"The durable fertility of land which contains shells in abundance is so wonderful, that I should not dare to describe it, were not the facts supported by the best authority. The calcareous matter for ages has been collecting and fixing in the soil such an immense supply of vegetable matter, that near two centuries of almost continual exhaustion have not materially injured its value. I have seen fields on York, James, and Nansemond rivers, now extremely productive, which are said to have been under cultivation for thirty and forty years, without any aid worthy mentioning, from rest or manure.

"The same cause operates on low lands, formed by alluvion, and situated on streams accustomed to overflow. Such land is, with very few exceptions, of the first quality; and it is made so by the calcareous matter which the currents must necessarily convey from the strata of marl through which they pass; and which being intimately mixed with sand, clay, and vegetable matter, is sufficient to form the finest and deepest soil. All the rich low grounds which I have had an opportunity of observing, have marl on some of the streams which fall into them, and I have not heard of any on those few which are poor. Not a solitary instance of shells being found in poor land of any description has come to my knowledge.

"If these premises are correct, no other conclusion can be drawn from them but that a proportion of calcareous earth gives to soil a capacity for improvement which it has not without; and it also follows, that by an application of shell-marl, the worst land would be enabled to digest and retain that food, which has hitherto been of little or no advantage."

* * * * * *

"The property of fixing manures is not more important in marl, than that of destroying acids. The unproductiveness of our lands arises, not so much from the absence of food as the presence of poison. We are so much accustomed to see a luxuriant and rapid growth of pines cover land on which no crop can thrive, that we cannot readily see the impropriety of calling such a soil absolutely barren.

"From the circumstance of this soil being so congenial to the growth of pine and sorrel, (both of which are acid plants,) it seems probable that it abounds in acidity, or acid combinations, which, (although destructive to all valuable crops,) are their food; while living, and product, when dead. The most common forest trees are furnishing the earth with poison as liberally as food, while it depends entirely on the presence of the antidote, whether one or the other takes effect. I have observed a very luxuriant growth of sorrel on land too poor to support vegetables of any kind, from green pine brush having been buried to stop gullies; and it is well known how much land on which pines have rotted is infested with this pernicious plant. Marl will immediately neutralize the acid, and this noxious principle being removed, the land will then for the first time yield according to its actual capacity: sorrel will no longer be troublesome; and, by a very heavy covering, I have known a spot rendered incapable of producing it, although the adjoining land is quickly set to the edge. Pines do not thrive on shelly land, whether fertile or exhausted. To this cause I attribute the great and immediate benefit I derived from marl on new-ground: the acid produced by the pine leaves is destroyed, and the soil is capable of supporting much heavier crops, without being (as yet) at all richer than it was."—*Com. to Pr. Geo. Agr. Soc.*

Before proceeding to state later experiments, and general practice and results, it will be necessary to recur to some other connected branches of the subject. The reader will pardon the apparent digression.

So well established and general has the opinion now become that this *marl* is a manure and a most valuable one, that it may seem strange that I should have only arrived at such an opinion, indirectly, by the train of reasoning indicated above. There were hundreds of persons who afterwards said, "Oh! *I* never doubted that marl was a good manure;" but not one of whom had been induced to try its operation. But passing by these *postponing* believers, and all others who confessedly never attached any value to this great deposite, it may require explanation why I had not learned its value from English works which treat so extensively on marl, even though I had then had access to but few of them. It was precisely because I *had* read attentively some of the English accounts of marl that I was *deterred* from using *our marl*, which agreed with it (apparently) in nothing but name. Struck with the importance attached to marl in England, I had earnestly desired to find it, and had searched for it in vain, years before the early beginning of my farming. The name induced a close examination of what was called marl here; but the "soapy feel," the absence of grit, the crumbling and melting of lumps in water &c., which were the most distinguishing characteristics of the marl of the English writers, were in vain looked for in our shell beds—of which the earth was generally sandy, never "soapy," and of which the lumps were often of almost stony hardness, and if not, at least showed nothing of the melting disposition of the English marls. I had before this, however, found in the American edition of the 'Edinburgh Encyclopædia,' more modern and correct views of marl, and had thereby learned to prize *calcareous matter* in general, as an ingredient of soil whether natural or artificial. But still, even admitting that the shelly portion of our marl would slowly decompose, and gradually furnish some manure to the soil, still it seemed that there was little prospect of its operating as the English marl, of such very different texture and qualities. I then supposed that the shells which had resisted decomposition, even where exposed on the surface of the beds, for centuries, would be as slow to dissolve, and to act as manure, if laid upon the fields. Still, notwithstanding these grounds of objection, the general idea of the value of calcareous manures would have induced me earlier to try fossil shells, but for being *deterred* therefrom by the only actual facts then known of the use. When speaking of my thought of trying marl to my friend, Mr. Cocke, he told me that it was not worth the trouble; that he (attracted merely by the name,) had made several small applications in 1803, on soils of different kinds, and that he had found almost no visible benefit; and he had attached so little importance to the trial, that he had never thought to mention it, until induced by my remark. This communication was enough to check my then slight disposition to try marl. The old experiments of Mr. Cocke, as well as some much older, and like his, considered worthless by the makers, and almost forgotten, are stated at page 36 of 'Essay on Calcareous Manures.'

As soon as I was satisfied that I had found in marl a remedy for the general and fixed disease of our poor lands, it became very desirable to know the strength of different beds, and of the different parts of the same bed. The rules of Davy, for determining the proportion of carbonate of lime, were easy to apply; and having provided myself with the necessary tests, and other means, I was soon enabled to analyze the specimens with ease and accuracy. This was a delightful and profitable direction of my very small amount of chemical acquirements, and served to stimulate to further study. The amount of knowledge was indeed very small—and is still so, with all later acquirements added. But little as I had been enabled to learn of chemistry, the possession led me to adopt my views of the constitution of soils, and enabled me to double the product, and to much more than double the clear profit and pecuniary value of my land, in the course of a few years after.

Though my own doubts as to the propriety and profit of marling had been removed by my first experiments, it was not so with my neighbors.

Small applications were indeed made by two of them only, in the next year after my first trial. But either because the land had been kept too much exhausted of its vegetable matter by grazing as well as cropping, or because the experimenters could not think of the operation of the manure as different from that of dung, or for both these reasons, it is certain that they were not encouraged by the results to persevere. They stopped marling with this one trial, until several years after, when both recommenced, then fully convinced of the benefit, and were afterwards among the largest and most successful marlers. One of these persons was the late Edward Marks, of Old Town, and the other my old friend Thomas Cocke—who though he had led me to find the disease, could not be speedily convinced of its true nature, or of the value of the remedy. As late as 1822, when he walked with me to an enormous excavation which I was then making in carrying out marl, he said to me, that, "In future time, if marling shall then have been abandoned as unprofitable, this place will probably be known by the name of '*Ruffin's Folly*.'" For some years, my marling was a subject for ridicule with some of my neighbors; and this was renewed, when in after-time the great damage caused by improper applications began to be seen, and which will be described in due order.

Having had in view from the beginning the true action of marl, and fully believing that its good effects would be permanent, and even increasing with time, under a proper system of tillage, I was no more discouraged by what some deemed small profits, than I was annoyed by the incredulity and ridicule of other persons. Almost all the farms in the neighborhood except mine, were regularly and closely grazed, when not under a crop, and, of course, they had not stored up in the soil much either of inert vegetable matter, or its acid product. Mine had not been grazed since 1814, and had been rested 2 years in every 4; and 3 years in 4 on the poorest land. And though, in truth, no increased production had been obtained by this lenient treatment, inasmuch as the increase of acid counterbalanced the increase of vegetable food, still when marl was applied, the acid was immediately destroyed, and the food left free to act. The effect of marling was generally shown most plainly on the first crop of corn, and the limits could be easily traced, by the deep green color of the plants before they were five inches high; and the increased product of the first crop, on acid soils, rarely fell under 50 per cent., was most generally 100, and has been known to be 200 per cent. But even such increase was not satisfactory to many persons, until the action of marl came to be better understood, and the permanency of the effects were credited. In five or six years after my commencement, there were few if any of those of my neighbors, who had marl visible on their lands, who had not begun to apply it. And though it has been injudiciously as well as insufficiently applied since, and not one-fourth of the full benefit obtained, still the general improvement and increased products of the marl farms of Prince George have been very great. The existence of marl, too, which was known at first but on a few farms in my own neighborhood, has been since discovered in many and remote parts of the county; and wherever accessible, it is valued and used. The like observations will now apply to most of the other counties of lower Virginia. Wherever the effects of marling could be seen for a few years, the early incredulity not only disappeared, but most persons were even too ready to believe in marl possessing virtues to which it has no claim. Thus, ignorant or careless of its true mode of operation, they crop the marled lands more severely than before; and if they are not thereby soon reduced as low as their former state of sterility, they are made to approach it as nearly as possible, and at a sacrifice of nine-tenths of the profit from marling which a more lenient and judicious system of cultivation would have insured.

In 1819, the second year, my marling was increased to 62 acres, but most of it at too thin a rate. In 1820, only 25 acres, though at 600 heaped bushels or even more to the acre. Up to this time I had done as most other persons have, that is, attempted to marl "at leisure times," and without making it a regular employment for a certain additional force, or reducing the amount of cultivation, or of other operations on the farm. No person will ever marl to much advantage, who does not avoid this error; and this year's labors showed the necessity of an alteration. The next year, two horses and carts, with the necessary drivers and pit-men, were appropriated to marling at all times when weather permitted, except during harvest, thrashing, and wheat-sowing times. Viewing marling too as the most profitable operation, except the saving of a crop already made, it was made a fixed rule of the farm that marling was to be interrupted for nothing else. My corn shift for that year was reduced in size one-half—so that one-half could be marled while the other was under cultivation. By these means, I marled 80 acres this year, 1821, (and too heavily,) and had all the lessened corn-field on marled land. The product of the half was equal to what the whole had brought before, and I was enabled thereafter to have every field marled over in advance of its next cultivation. In 1822, the land marled was 93 acres, 100 in 1823, and 80 in 1824, which served to cover nearly all of the then cleared land requiring marling. The next three years' marling amounted respectively to 60 acres, 94 acres, and 27 acres, being principally upon land subsequently cleared and brought into cultivation. Since then, there has been no marling on the farm, except on wood-land, not yet cleared, and on small spots formerly omitted, and of which no account was taken. With the exception of such spots, (and some such still remain, because of their inconvenient position,) all the land which was not naturally calcareous, or too wet or too steep for carting on, had been marled by 1827; and none has required any additional dose, though some of the thinnest covered places had been re-marled long before that time, so as to bring them to a proper constitution.

In 1824, I first observed, (and had never before suspected such effect,) the injury caused by having marled acid soil too heavily. To show my first impressions, I will copy the words of my farm journal, written on the very day on which the discovery was fully made.

"June 13th, 1824. Observed a new and alarming disease in a large proportion of my corn—and what makes the matter much worse, the evil is certainly caused by marling. The disease seems to have commenced when the corn was from 6 to 10 inches high, and to have stopped its growth. Its general color is a pale sickly green, and the leaves appear so thin as to be almost transparent: next they become streaked with rusty red, and then begin to die at the upper ends. Several pulled up, showed no defect, or injury from insects, among the roots. All the land marled from pits Nos. 7 and 9 (both yellow) from 1820 to 1822, is so much diseased as to promise not more than half a crop. The corn is twice as large as on the spaces left for experiment without marl, yet looks much worse; though 8 weeks ago its superiority in color and vigor was even more than in size. With but few exceptions, the land *newly* marled from the same pits, and the old marling from Nos. 1 and 8, (both blue) as well as that not marled, are free from this disease. The parts most affected are those which were driest and poorest, and of course were least covered with vegetable matter. Yet though the corn on this old marling is generally so bad, it is yet evident that the land is more benefited by the manure than at first: flourishing stalks of corn, 18 to 24 inches high, are seen frequently within a few feet of those most hurt by this disease."

Subsequently, when the whole extent of injury could be seen, the following remarks were written in the journal, at the date below.

"October 15th. The damage caused by marl to this crop I suppose to be about one-third of what the land would otherwise have made, judging from the present and former measurements of the same land, where experiments were made.

"Nearly all the heavy marling in Finnies (at 800 bushels,) about 20 acres,* suffered by it; the the poorest and lightest most injured, here and in Court-House Field. The few rich spots escaped, as did most of the piece plastered (on the heavy marling) in 1820. The marks of this experiment were destroyed, and the superiority was not so regular as to enable me to trace the outlines of the gypseous earth—but an acre of corn might be taken which certainly was plastered, better than any other acre in the old land. This at least proves that *gypsum* contained [if any] in the marl has not caused the disease. The poor land lightly marled in 1819, showed but little of the disease, and none was found in the piece not marled, nor in any marled since the last crop [or now first cultivated since being marled.]

"In Court House Field, the injury was confined to 19 acres, the poorest part of the field, which was in corn in 1821,† marled and fallowed, 1822, and in wheat 1823, corn 1824. The remainder of the old land, which had not been cropped so severely, and was covered as heavy with *blue-marl*, brought a fine crop, quite free from the disease. The new-ground was mostly marled very heavy (800 bushels of $\frac{45}{100}$)‡ and this and all my former clearings, (some marled equally heavy,) were also quite free. These facts satisfy me that it was not the quality, but the over quantity of marl which has caused the evil; and that the land which has escaped, owes its safety to its containing more vegetable matter. I forgot to state that on some of the lightest spots of South Field, the wheat was much injured, though blue marl was used there.

"If I had followed my own advice to others, "to put no more marl at first than would but little more than neutralize the soil, and repeat the dressing afterwards" this evil would not have fallen on me. The present loss is not much; but it makes me expect the same on all similar land, marled as heavily. I shall endeavor to avoid it, by giving vegetable matter to the soil—either by manuring, or by allowing 1 or 2 more years of grass in the first term of the rotation. Why the quantity of marl applied should do harm in *any* case, is more than I can tell; but I draw this consolation from the discovery—if a certain quantity, (say 500 bushels per acre) is too much for present use of the soil, it proves that it will combine with more vegetable matter, and fix more fertility in the soil, than I had supposed. That the second crop should be injured, and not the first, is owing to the unbroken state of the shells at first, and, by their being reduced, twice as much calcareous matter is in action after a few years."

Thus it will be seen, from these entries made at the time, that I took a correct view of this great and unlooked-for evil, and was by no means discouraged, or induced to lessen my efforts in marling. But in all after operations, on poor land, the quantity was lessened from 500 and 600 bushels, (and even more of the poorest marl,) to about 300 bushels. With this alteration, the operation was continued with as much zeal as before; and also at a later time on another farm (Shellbanks) purchased afterwards, and where I marled upwards of 400 acres.

When this injury was first discovered, about 250 acres of very similar land had been marled so heavily that the like mischief was to be looked for in the next crop, and thenceforward, if not guarded against. For a more full account of this disease, and my opinions thereon, I must refer to what has been before published, (Essay on Cal. Man. p. 51.) It is sufficient here to say that by pursuing the means there advised—in allowing more rest from grain crops, furnishing vegetable matter to the land, in its natural cover of weeds, in clover, and farm-yard manure so far as the limited supply sufficed—that no very great loss was subsequently suffered, except in the field where the disease was first discovered, and which was marled in 1819. This field was too remote and inconveniently situated, to be manured from the barn-yard; and from that and other causes, (including the failure of clover,) that field, only, still shows injury from marling in the present crop (1839); so much diminished, however, that its general average product this year is fully twice as much as the land could have brought before being marled.

The results of many particular experiments made during the progress of marling this farm were stated in the 'Essay on Calcareous Manures,' and the general benefits and improved products were described in a later publication (page 112 of vol. vii, Far. *Reg.*). *It is not* necessary here to repeat these statements. But as this article may come under the notice of some readers who have not access to the others, the general results, as produced in the whole period of twenty-two years, from the earliest experiment to the last product, will be here very concisely and generally stated.

The many and extensive *old galled parts* of sloping land, wherever dressed with marl, and even without the further help of barn-yard manure, are now nearly all *skinned over* by a newly formed soil; and though such soil is both poor and thin, and may yet long remain so, the *whole* of its present productive power is due to marling; as such galled land was, before, naked, entirely barren, and irreclaimable by other manures. Where much or rich putrescent matter has been also applied to galls, with or after marl, both rich and durable soil has been formed, though at great cost.

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* See Exp. 10, p. 43 Essay on Cal. Man.

† Exp. 11, p. 45.

‡ Exp. 1 to 4, pp. 37 to 40.

The more level parts of the old and greatly exhausted fields, and the newly cleared wood-land, both kinds being naturally poor, thin, and acid soils, are the only lands which have enjoyed anything like the full beneficial effects of marling. These have been increased in product from 5 and 10 bushels of corn per acre (which may be considered the usual minimum and maximum rates,) to at least 20, and in some cases to 35 bushels, even without the aid of barn-yard manure. Where putrescent manures have been also applied, they have raised the products higher; and these manures are now as durable and as profitable, as formerly they were fleeting and profitless in effect.

The before poor and light soil which formed the greater part of the old arable lands, and which was not above three inches in depth, (and scarcely two inches, when in its natural forest state,) is now seven inches and more, and requires three-horse ploughs to break it to proper depth, where the one-horse ploughs formerly would frequently reach and bring up the barren subsoil.

The valuable operation of marl has increased with time, even where the effects were also the most speedy.

The soil, which before was totally unable to support red clover, is now (except on the most sandy spots) well adapted to the growth, and capable, according to the grade of fertility, of receiving the great benefit which is offered by that most valuable of improving crops.

And generally—notwithstanding all the many and great errors committed in my marling, (for want of experience,) and of still worse general farm management—and though a considerable proportion of the old land was either but little or not at all fit to be improved by marling—and though the land added since by new clearings was all very poor, and worthless for its natural producing power—still the general annual grain products of the farm have been increased from three to four-fold, and the net profit of cultivation and the intrinsic value of the land have been increased in a still greater proportion.

EXTRACTS FROM BEVERLY'S HISTORY OF VIRGINIA.

Of the earths and soils.

The soil is of such variety, according to the difference of situation, that one part or other of it seems fitted to every sort of plant that is requisite either for the benefit or pleasure of mankind. And were it not for the high mountains to the north-west, which are supposed to retain vast magazines of snow, and by that means cause the wind from that quarter to descend a little too cold upon them, 'tis believed, that many of those delicious summer fruits growing in the hotter climates, might be kept there green all the winter, without the charge of housing, or any other care than what is due to the natural plants of the country, when transplanted into a garden. But as that would be no considerable charge, any man who is curious might with all the ease imaginable preserve as many of them as would gratifie a moderate luxury, and the summer affords genial heat enough to ripen them to perfection.

There are three different kinds of land, according to the difference of situation, either in the lower parts of the country, the middle, or that on the heads of the rivers.

The land towards the mouth of the rivers, is generally of a low, moist, and fat mould, such as the heavier sorts of grain delight in, as rice, hemp, *Indian* corn, &c.

This also is varied here and there with veins of a cold, hungry, sandy soil, of the same moisture, and very often lying under water. But this also has its advantages, for on such land generally grow the huckle-berries, cran-berries, chincapins, &c. These low-lands are for the most part well-stored with oaks, poplars, pines, cedars, cypress and sweet-gums, the trunks of which are often thirty, forty, fifty, some sixty or seventy foot high without a branch or limb. They likewise produce great variety of evergreens, unknown to me by name, besides the beauteous holly, sweet-myrtle, cedar, and the live-oak, which for three-quarters of the year is continually dropping it's acorns, and at the same time budding and leaving others in their stead.

The land higher up the rivers throughout the whole country is generally a level ground, with shallow vallies, full of streams, and pleasant springs of clear water, having interspersed here and there, among the large levels, some small hills and extensive vales. The mould in some places is black, fat and thick laid, in others looser, lighter and thin. The foundation of the mould is also various, sometimes clay, then gravel and rocky stones, and sometimes marle. The middle of the necks or ridges between the rivers, is generally poor, being either a light sand, or a white or red clay, with a thin mould. Yet even these places are stored with chestnuts, chinkapins, acorns of the shrub-oak, and a reedy grass in summer very good for cattle. The rich lands lie next the rivers and branches, and are stored with live-oaks, walnuts, hickories, ash, beech, poplar, and many other sorts of timber, of surprising bigness.

The heads of the rivers afford a mixture of hills, vallies and plains, some richer than others, whereof the fruits and timber-trees are also various. In some places lie great plats of low and very rich ground, well timber'd, in others large spots of meadows and savannas wherein are hundreds of acres without any tree at all, but yield reeds and grass of incredible height. And in the swamps and sunken grounds grow trees as vastly big as I believe the world affords, and stand so close together that the branches or boughs of many of them lock into one another; but what lessens their value is that the greater bulk of them are at some distance from water carriage. The land of these upper parts affords great variety in the foundations of the soil or mould, of which good judgment may be made by the plants and herbs that grow upon it.

The rivers and creeks do in many places form very fine large marshes, which are a convenient support for their flocks and herds.

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There is likewise found great variety of earths, for physick, cleansing, scouring, and making all sorts of potter's ware, such as antimony, talk, yellow and red oker, fuller's earth, pipe clay, and other fat and fine clays, marle, &c. In a word, there are all kinds of earth fit for use.

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Have you pleasure in a garden? All things thrive in it, most surprisingly; you can't walk by a bed of flowers, but besides the entertainment of their beauty, your eyes will be saluted with the charming colors of the humming bird, which revels among the flowers and licks off the dew and honey from their tender leaves, on which it only feeds [the means on which alone it feeds]. It's size is not half so large as an English wren, and its color is a glorious shining mixture of scarlet, green and gold. Colonel Byrd in his garden, which is the finest in that country, has a summer-house, set round with the Indian honeysuckle which all the summer is continually full of sweet flowers, in which these birds delight exceedingly. Upon these flowers, I have seen ten or a dozen of these beautiful creatures together, which sported about me so familiarly, that often with their little wings they fann'd my face.

Hunting.

The *Indians* as I have already observed had in their hunting, a way of concealing themselves, and coming up to the deer, under the blind of a stalking-head, in imitation of which, many people have taught their horses to stalk it, that is, to walk gently by the huntsman's side to cover him from the sight of the deer. Others cut down trees for the deer to browse upon, and lie in wait behind them. Others again set stakes at a certain distance within their fences, where the deer have been used to leap over into a field of peas, which they love extremely: these stakes they so place, as to run into the body of the deer, when he pitches, by which means they impale him.

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They hunt their hares (which are very numerous) a-foot, with mungrils, or swift dogs, which either catch them quickly, or force them to hole in a hollow tree, whither all their hares generally tend, when they are closely pursued. As soon as they are thus holed, and have crawl'd up into the body of the tree, the business is to kindle a fire, and smother them with smoak, till they let go their hold, and fall to the bottom stifled, from whence they take them. If they have a mind to spare their lives, upon turning them loose, they will be as fit as ever, to hunt at another time: for the mischief done them by smoak, immediately wears off again. * * * * *

They have another sort of hunting, which is very diverting, and that they call vermine hunting. It is performed a foot with small dogs in the night, by the light of the moon or stars. Thus in the summer-time they find abundance of raccoons, opossums and foxes in the cornfields and about their plantations, but at other times, they must go into the woods for them. The method is to go out with three or four dogs, and as soon as they come to the place, they bid the dogs seek out, and all the company follow immediately. Wherever a dog barks, you may depend upon finding the game, and this alarm, draws both men and dogs that way. If this sport be in the woods, the game by that time you come near it, is perhaps mounted to the top of an high tree, and then they detach a nimble fellow up after it, who must have a scuffle with the beast, before he can throw it down to the dogs; and then the sport increases to see the vermine encounter those little curs. In this sort of hunting they also carry their great dogs out with them, because wolves, bears, panthers, wild-cats, and all other beasts of prey are abroad in the night. For wolves they make traps, and set guns bated in the woods, so that when he offers to seize the bate he pulls the trigger, and the gun discharges upon him. What Elian and Pliny write of the horses being benumb'd in their legs, if they tread in the track of a wolf, does not hold good here; for I myself and many others, have rid full speed after wolves, in the woods, and have seen live ones taken out of a trap, and drag'd at a horse's tail, and yet those that follow'd on horse-back have not perceived any of their horses to falter in their pace.

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Wild horses.

There is yet another kind of sport which the young people take great delight in, and that is, the hunting of wild horses; which they pursue sometimes with dogs, and sometimes without. You must know they have many horses foaled in the woods of the uplands, that never were in hand, and are as shy as any savage creature. These having no mark upon them, belong to him that first takes them. However the captor commonly purchases these horses very dear, by spoiling better in the pursuit; in which case he has little to make himself amends, besides the pleasure of the chace. And very often this is all he has for it, for the wild horses are so swift, that 'tis difficult to catch them, and when they are taken 'tis odds but their grease is melted, or else being old, they are so sullen that they cannot be tam'd.

MARLING IN SUSSEX. PHILIPS' MARL RAISING MACHINE.

To the Editor of the Farmers' Register.

Shellbottoms, Sussex Oct. 15. 1839.

Though wholly unaccustomed to write for the public, I cannot repress the strong desire I have to address you a few lines for the purpose, and in the hope at least, that my attempt may be of some service to the great cause you have long zealously and efficiently promoted. But enough of preface. It is known to you, that about two years ago, I discovered on my farm a large body of fine strong marl, yielding by analysis of three or four pits, 35 per cent at top, 55 at 5 feet, and 68 to 72 at 10 feet in the bed, two or three of the pits opened by me having been worked to that depth without any apparent diminution of quality, and one only being so mixed with large lumps of sand at 8 or 9 feet deep, that we abandoned it. My first efforts were with manual labor, to throw it on the surface; but hearing repeatedly of Mr. Philips', and one other machine of great promise, and indeed, when in use, giving conclusive proof of the value of it, I prepared the timber, engaged Mr. George Philips the inventor, to assist, and in the month of March last, he, with my own carpenters built one for me, and put it to work. I wish all improvers with marl who get it from pits of caving earth, or water running in so freely as to be in the way, would come and look at mine when at work, being well convinced myself that in such situations they are extremely valuable.

I commenced raising marl by hand two years ago in August, and during that year, and the following winter, got out 25,000 bushels, which was applied to the land at the rate generally of 250 bushels per acre. In one instance, on a wet, low, waste spot of land, of about 4 acres, I ploughed in about 375 bushels to the acre; the corn crop on it was good for such land. In March, it was sown in oats, and in a few days, say by the 20th of the month, in clover seed. The crop of oats was very fine. The clover took kindly, has been, in August, 3 feet high, and is now as thick as need be, and about two feet high. The field in which this spot is situated, contains 45 acres. The whole was marled and ploughed in with double ploughs, 5 inches deep, but the covering very scant, nothing in fact but a scattering growth of weeds and a little crab grass and hen's-nest grass. I marled a slip fifty feet wide, across the field, from north to south, at the rate of 125 bushels per acre, and another of twenty-five feet wide half across, at 500 bushels per acre. I am unwilling to pronounce any opinion as to the difference between the crops, corn, oats, or clover, grown on the scant, on the average, or on the double quantity of marl. You will keep in mind that the body of the field was marled at the rate 250 per acre. I shall notice the progress of the next crops of corn and wheat, and will then let you know decisively my opinion as to the advantage or propriety of applying either of the different quantities. I am the more desirous to set some others at observing the difference between the very large and the small quantities, because it is stated in the September No. of the Register, that 100 bushels of marl is enough for one acre of land.

I am now at work with the machine raising marl, though the quantity on the surface at the different pits is estimated (guessed would be the best term,) at 50,000, and from that to 30,000. In three weeks, if weather permit, more will be ready for the carts than I can haul away in twelve months. I am an enthusiast in your cause; in fact it is mine, and every patriot's cause, and I conform strictly, except as to quantity of marl, with your directions in your 'Essay on Calcareous Manures.' I sow clover, but a small portion only is to be grazed, and it is accordingly kept sacred from the hoof; though I have lately obtained at great labor, and risk, and some expense of money, two fine calves of the Durham short horn half blood, four lambs, two of each sex, of Bakewell and Merino blood, very fine size, wool and form, and the calves unequalled before among us; and two pigs of an extraordinary size, and beautiful appearance of their age, milk-white in color.

In my endeavors to escape from, or to cure a terrible disease which had afflicted me for three years, I went up to the vicinity of Winchester, the last of July. On my way, and whilst staying over the ridge, I saw not an acre of clover equal to my own sown in March last, on good land to be sure, and marled at the rate of three hundred bushels to the acre. We had cut about one-third of the lot, the whole being 7 acres, for seed, and at my return, 29th September, it was still superior to any I left in that fine clover country, which I had just left. It shall not, however, be concealed that the last spring was fatal to clover there. I did not see a stack of clover hay, nor hear of one, in the country. Seed clover was almost as scarce, but under the belief that it could hardly be got for sowing, several in the vicinity of Whitepost were cutting a little for their own use; but only two men, spoken of in the country, would make over twenty bushels, and those two together, perhaps two hundred bushels. And here more information is respectfully solicited from men of experience, for my own and for the general benefit. Is it best to clean it or pluck it from the straw and stem, and sow it in the chaff? If to clean be best, what is the most approved method of doing so? And particularly, I would like to know if any one has ever tried the cotton-gin; passing it between the saws in the manner of cotton. One of your correspondents in the July No., asserts that the difference is nothing at all between using marl as a top dressing and ploughing it in, and this, as he asserts, after an experience of forty years. Now, Mr. Ruffin, let it be understood by all, that I have on the surface ready to be hauled and applied in my best guess, 30,000 bushels, and am within a few days of being ready in every respect to commence moving it; think of the difference to me, between applying 250 and 125 or 100 bushels to the acre! And not to me alone, but to others, the fact would be important if it were well ascertained that 125 bushels, say, is as good to the acre, as 250, and that the mere sprinkling it on the top of the land, answers as well as ploughing it in. I am well convinced, that it takes me nearly as long to plough in, as to haul; and by the rule of three, it would take twice as long to apply 250 as 125 bushels, but such is not the fact, for the more land you marl, the further you would be from the pit at the end of every day or two; it is easy and plain however, to see that the saving of time and labor to the improver would be prodigious. The answers to the questions I have asked, would I think be of general benefit, and under that view of the matter, I hope that men of knowledge and experience will give their information to the public through you, and all of us be benefited by their communications.

Thus must close my first essay in this line, only begging that whatever you may think tiresome, or valueless, may be erased at your discretion, or the whole thrown into the fire if you think it best. Whatever be the success of my letter, I am deeply anxious for the success of the agricultural interests, and am your friend, and humble servant,

JOSEPH MASON, sen.

November 8*th*, 1839.

P. S. Forgetfulness, rather than the want of importance, prevented me from giving you in my late communication the description of my marl machine, which so well deserves notice. I state this as an apology for adding a few paragraphs, though fearful that it is too tedious and too long to meet with your approval. Mr. Philips, the inventor, gave me a bill of the timber, amounting to, say 1000 feet, and so full an explanation of the machine as to enable my own workmen to do all except two or three days work, which was aided in and superintended by Mr. Geo. Philips himself. The machine was put in operation merely to try it in March last, but no work done. When our crop was "laid by" as the phrase is, my son (I being in Frederick in pursuit of health so long unknown to me) did not keep an account of the days employed, but it could not be more than 35 days. Four and sometimes five hands were employed. In the want of that sort of daily account of progress it is impossible to say what number of bushels were raised in any one day, but of the general result there is but one opinion by my son and myself. Upon my return we decided that four hands could with ease do four times as much as without it; 5 or 6 can work without incommoding each other. We think the quantity of 20000 bushels, and the work is by no means laborious. In the preceding twelve months we had raised with an equal or greater number of hands a little less than 26000 bushels. I have begun only yesterday to haul it with excellent teams, two wagons and two ox-carts, for I find the wagon and ox-cart more advantageous to employ than single-horse carts. My son thinks $80 ample pay for building a machine, every thing being found. We find a material difference between one pit and another; some ground is very sandy, and caves badly, and the water comes in more freely. We have, however, few such spots. I think the machine will raise in my common pits, with 5 hands, 600 and probably 750 bushels per day, and the digging the marl is the hardest of the labor. J. M.

REMARKS.

We are much gratified to meet our good old friend as a contributor to the pages of the Farmers' Register; and it adds much to this gratification to know, from this and other sources of information, that in his old age (and diseased and feeble, as we regret to learn,) he is marling his land with all the energy and enthusiasm of youth; and in a few years from the first discovery of his marl, his labors will have doubled the product of the farm which he had so long before cultivated, without producing any increase of fertility or productiveness. May he not only see the certain and speedy result of his present labors, but live long in health to enjoy the greatest reward which can be bestowed on a farmer—the seeing the new and permanent productiveness of his land caused by his own labors of mind and body. His example, too, we hope will do more for his countymen, than have our precepts and example united. For, very few landholders in Sussex have yet availed properly of the marl which underlies the whole county; and there is no county in Virginia, possessing that natural advantage, which is less indebted to our instruction, or that has heretofore given less support to, and of course received less benefit from, the publication of the Farmers' Register. Yet we will dare to assert that if the *instruction there* offered, even as to marling alone, had been availed of, that the agricultural value and profits of the county would have been already doubled, and that by improvements yielding clear gain immediately and permanently. We proceed to answer our friend's inquiries.

No precise quantity of marl can be correctly prescribed as a general rule. It is necessary to know in advance, 1st, the strength and character of the marl, 2nd, the texture and degree of fertility of the soil, and 3rd, the treatment to which it had been, and is designed to be subjected in cultivation. Yet with these *three data*, it is easy for any farmer to apply a proper quantity in every possible case. The more clayey and still more the richer the land, or the more full of vegetable matter, and the poorer the marl, the heavier should be the marling; and the lighter in proportion to the extent of the reverse conditions—or to the sandiness, poverty and nakedness of the land, and the richness of the marl. In one case, 100 bushels of marl may be as much as is profitable or safe to apply; and in another it would be both safe and profitable to give 800. General rules to this effect, but more fully stated, are given at page 56 of 'Essay on Calcareous Manures,' 2nd Edition.

We have never attached much importance to the difference of laying marl on the grass or weeds, and ploughing under for a crop, or on the surface of the land after being ploughed. Each mode has its peculiar advantages and disadvantages, which are so nearly balanced, that it is best to consult convenience in other respects, and choose accordingly. If to be ploughed under with the turf or weeds, (and mixed by the *tillage* of the crop,) marl will have most of early *effect, because* of its being in contact with the putrescent matter, and of their reciprocal and beneficial action on each other. But the attendant disadvantage is, that, if ploughed under with a good furrow, or even five inches deep, the subsequent tillage will not serve fully to bring up and mix the marl with the soil, without which (and especially if lying beneath) the marl is of very little effect. If carted on after the land has been ploughed, and mixed by the subsequent tillage, the mixture will be much more perfectly made. But the labor of carting on ploughed land is greater, and the operation is of course hurtful, by making the ground hard.

But the ploughing under of marl is worse than labor thrown away, unless for the immediate cultivation of a crop. If laid on land a year or more (as may sometimes be convenient) before the field is to be cultivated, it will be much better to spread carefully, and leave it on the surface, than to plough it under, and so leave it to stand. Marl (or lime) if in lumps or masses, no matter how soft, will be of no use as manure. The manure should be mixed and diffused through evey part of the soil, and not placed deep at first.

We have heard before of the value and operation of the machine of Mr. George Philips, (of Petersburg,) and have urged its ingenious inventor to serve the marling interest by having such machines erected for his own profit. But though he has aided and given the necessary instructions to build several, which have served their purpose to the entire satisfaction of the different proprietors, he has not sought to make the machine an article of profit to himself, and thereby to make it the most profitable to the public. Strange as it may seem too, he has not even wished nor thought of *preventing* its construction by others, by the protection of a *patent-right*. If we could have obtained a draught and description of the machine, we should before this, have published them. But we have not seen one, and have formed our favorable opinion merely from the report of others. Whoever desires to draw marl from a considerable depth, or from wet pits, will do well to apply to Mr. Phillips, (at Petersburg,) for his instruction, which he will not withhold, even if he may not find it convenient to undertake the construction desired.

—ED. F. R.

LETTERS FROM A YOUNG FARMER TO MR. JAMIESON.

To the Conductor of the Farmers' Magazine.

Sir: Three years ago, I sent you a series of letters from a young farmer to his father, (*vide* Vol. 8. p. 84. *et seqq.*), which, I understand, met with a favorable reception. Influenced by the like motive as then guided me, namely, to disseminate practical information concerning rural affairs, I, at this time, take the liberty of handing you some letters from the young farmer to his *quondam* preceptor, written after a farm had been taken on his account, wherein a picture, tolerable correct, is furnished of the several articles of business which usually occur during the first twelve months of a lease. The operations formerly detailed were perhaps executed upon a scale rather too large to be imitated by men of ordinary capitals; but those to be now described merit a different character, being in fact an exact representation of what daily occurs in every quarter of the country. I have arranged the letters into four classes as formerly; one of which may, if you please, be presented in each number of this volume. In class first, the young man is put into possession of his farm. In the second, the ground is cultivated and laid down for his first crop. In the third, his grass and turnip husbandry is described. And in the fourth, his harvest-work, &c. is fully explained. These are the leading and chief subjects discussed in each class, though digressions are often made to other matters naturally occurring in the course of the correspondence. I trust the whole will be acceptable to your readers; and, in particular, that such of them as are entering upon rural life, without having acquired knowledge in the school of experience, will, in several respects, be thereby benefited. At all events, the correspondence may serve to amuse, if it does not prove beneficial to the readers of your work, and, under these impressions, it is respectfully submitted to their impartial consideration. I am yours, &c.

PHILO-GEORGICON.

Class 1st.

February 8th.—Having concluded an agreement with the proprietor of the farm mentioned in my last, permit me to crave your advice with regard to my future conduct. I am encouraged to take this liberty, by a remembrance of your former kindness, and also by an impression that the firmest dependence may at all times be placed upon your prudence and judgment. Do, my dear sir, favor me with your assistance on this occasion; for, if I once go wrong, it may be a long while before I go right. Listen with patience to my desultory opinions; and examine with attention the crude and undigested schemes that may be presented. Correct me when wrong, and keep me from straying into the paths of error. Often have you told me, that perfect management could only be learned in the school of practice; and that a long attendance was necessary before the ablest scholar could merit the character of a good agriculturist. All these things now rush upon my mind when I am going to enter into rural life, and urge me to unbosom myself to one capable of affording the aid that is wanted. Excuse these egotisms. Attribute them entirely to that anxiety which every one must, less or more, feel on such an occasion; especially if without confidence in their own abilities.

The farm I have taken contains three hundred Scotch acres, divided into eighteen enclosures, and pretty well situated, both as to obtaining a full supply of lime, and to good markets, where produce of all sorts may be readily disposed of at a fair price. The soil is of different qualities and varieties; one half of it being a strong deep loam approaching to clay, and naturally well calculated for the culture of beans and wheat; about fifty acres are of thin clay, capable of carrying wheat if well manured, but apparently unfit for an extensive rotation; and the remainder is good turnip soil, though not of a gravelly nature; therefore, able to carry peas and beans. The whole farm is in tolerable good order at present, having been preserved in shape by the former tenant; that is to say, he was not permitted to take two white crops in succession during the last five years of his lease;—a regulation which, so far as I know, has been strictly adhered to. According to the lease, he was also bound to leave one sixth of the farm in grass of different ages; and the like quantity uncropped, as a turnip or fallow break; which prestations are complied with. He is likewise bound to leave the whole dung of the penult crop upon the premises for the use of his successor; so, from these things, you will see that my entry cannot be considered as an unfavorable one. For the dung, and the land that is uncropped, value is to be paid him, according as the same shall be ascertained by neutral men of skill and capacity mutually appointed. The condition of the houses and fences is also to be submitted to neutral men. Here, my dear sir, allow me to request that you would act as my arbiter on this occasion. The matters to be determined are of some importance to me; and I am the more anxious to have my interest under your guidance, since I learned from my father that heavy losses, on one side or other, are often sustained, when unqualified persons sit in judgment. The clause with regard to fences bears, that they are to be capable of keeping in cattle and sheep; and as to houses, that they are to be in good habitable condition. To me these terms appear loose and unprecise; though, to persons of experience, their meaning may not be doubtful.

I come now to the rent agreed upon; which I am fearful may be too high; but, being offered under the express sanction of my father, must be reckoned as not higher than the market value of similar soils. In short, the rent agreed upon is one thousand guineas, or three pounds ten shillings per acre, which is a smart one, especially as the public burdens, say property-tax, horse-tax, window lights, statute-labor, &c. must be added; and these may be computed at ninety pounds, or six shillings per acre more. My father, in valuing the farm, trusted much to the goodness of its condition, and the regular mode of cropping exercised for several years; and assured me, that, under different circumstances, his estimate would have been curtailed considerably. He added, that he has known farms newly taken, where one year's rent could not be paid out of two crops; whereas, in the present instance, the rent might nearly be paid at the outset. This, to be sure, is an important matter; freeing me from an expensive outlay in the first instance, which, in fact, would operate afterwards exactly in the same way as so much more rent. I wished greatly to have had the benefit of your advice before the transaction was concluded; therefore, felt much concern when I learned that your other engagements prevented us from obtaining it.

Allow me, in the next place, to solicit your advice concerning the most suitable rotations of cropping for the several soils described. I shall throw out my crude ideas on that subject, submitting them entirely to your better judgement.

First—On the strong loam, I am inclined to think that an eight, course shift may be most profitably followed, especially, as that soil is divided into eight enclosures, some of them more, some of them less than twenty acres, which would cause the arrangement to suit well when grass was resorted to. The rotation might commence with a complete summer-fallow; 2. go on with wheat and grass seeds; 3. pasture; 4. pasture; 5. pasture; 6. oats; 7. beans; 8. wheat. My father thinks, as the land is well enclosed, and profits from grass husbandry on the increase, that the benefits of this rotation may exceed those to be obtained from employing the plough more extensively; and that whilst only one dunging was required during the rotation, the whole crops may be expected good from the vegetable manure accumulated during the three years of pasturage.

Second—On the thin clays, it appears expedient to exercise a gentle rotation, otherwise full crops cannot be expected. Say, 1. summer-fallow with dung; 2. wheat and seeds; 3. clover and rye-grass; 4. oats. You have often told me, that grass husbandry did not pay on such soils after the first year, and that as good oats were got after one year's grass as after three years. Satisfied that these sentiments are well founded, I propose that the fifty acres of thin clay should be divided into four breaks, and cropped in the way described. According to any other plan, the same quantity of produce cannot be obtained at so little expense of labour. In fact, five, or at the most six ploughings, are only required during the whole rotation.

Third—As to the light soils, I am clear that turnips should be the basis of any rotation that may be adopted. This, I know, will gain your approbation. I am more doubtful about the after crops; but let me suppose the course to be as follows: 1. turnips; 2. wheat on the portion of ground cleared by the first of March; barley on the remainder; grass seeds to be sown with both; 3. clover and rye-grass, either to be used in soiling, or manufactured into hay; 4. oats; 5. peas and beans drilled; 6. wheat. There being one hundred acres of light soil, this gives about 16⅔ acres for each break. My father says the rotation is a good one, if dung can be administered twice in the course of it;—a point which cannot be ascertained at the present moment.

Now, let me bring the crops of the several rotations into one view, before calling your attention to the number of men and horses that will be required in their cultivation. Upon looking back, it appears that there will be nearly thirty-seven acres of wheat upon the strong loam; twelve and a half acres upon the thin clay; and twenty acres upon the light soils, supposing one half of the turnip break cleared in time, making, in all, seventy-four and a half acres annually under wheat. The extent of barley ground will be eight acres and a half, or thereby; of oats about forty-eight acres; of beans and peas about thirty-five acres, of turnips nearly seventeen acres, besides thirty-two acres of plain summer-fallow. The total number of acres, therefore, under the plough in one season, according to these rotations, is two hundred and fifteen; whereof one hundred and thirty-one will carry white corn crops, and fifty-two beans, peas and turnips; whilst eighty-five acres are in grass of different ages; and the remainder of the farm, viz. thirty-two acres, under the radical preparatory process of summer-fallow. In my humble opinion, the above sketch is not far amiss, especially as it includes the cropping of various soils, whose properties are so dissimilar, as to render what may be called good management upon one of them altogether inexpedient upon the others.

Do you think five ploughs and ten horses will be quite sufficient for carrying on the work I have chalked out? Or would you consider six to be necessary? To save a plough in these times, is the same thing as to save one hundred guineas; though I am well aware, if the strength kept is below the work to be executed, that every saving in the first instance will ultimately turn out a real loss to the person who attempts it. Still, as I remember that a plough with you cultivated more acres than I have mentioned, and know that an extensive farmer in this neighbourhood, whose farm is chiefly composed of loam and clay soils, had last season 380 acres under grain crops, whilst his strength did not exceed ten ploughs;—I say, when I reflect upon these circumstances, I cannot conceive that five ploughs will be insufficient for working the farm that I have undertaken. If I entertain any doubts, it is with regard to the summer work; because a defect in any part of what may be called the radical processes, is felt during the whole of the rotation, of which they form the basis. But, as a supernumerary horse may be useful, and serve to keep labor agoing when a casualty occurs, I can, with such an auxiliary, get on with horse-hoeing the drilled crops; at least, that necessary work may thereby be considerably assisted. Besides, as my spring work will not be extensive, the turnip and naked fallows can be earlier prepared than otherwise would be practicable. Little more labor will be required for the turnip break, than formerly allotted to the same extent of barley ground; and, by performing that labor at an early period, the work of the season will be thereby greatly advanced.

I have engaged five married servants as ploughmen, and two as laborers at odd work. Each of them is to get 12 bolls of oats, 3 bolls of barley, and 2 bolls of peas, with maintenance for a cow through the year; the carriage of what coals are wanted, land for sowing a peck of lintseed, and land for planting potatoes to the extent of one-tenth of an acre. The servant who is to sow the corn, gets also a pair of shoes; and if he continues with me till next year, he is to receive half a boll of wheat, or the value of it, for stacking the crop: the whole are to have maintenance in harvest. But as I will not have any harvest work for this year, it is stipulated that each man is to receive 3 firlots of oat meal in lieu of his maintenance.

The fallow and turnip break left by my predecessor, got one ploughing from him, according to the lease, for which he is to receive payment. I am endeavoring to engage people in the neighborhood to cross-plough the part intended for turnips, as soon as the weather permits; and will also try to get the plain fallows cross-ploughed as early as possible. Upon inspecting the fields diligently, my father is of opinion, that no more than 12 acres can this season, with propriety, be under turnip crop, there being a hazard that the ground would not in time be suitably prepared. I have offered 12s. per acre for the first and second furrows, and 2s. per acre for each close double time of harrowing; and am in hopes these offers will be accepted. The rest of the work may be delayed till I am in possession. Advise me what sort of stock will be most eligible for the grass land at Whitsundy. Very likely, as there are no restrictions upon my predecessor in that respect, it will at that time be eaten down to the roots; therefore, to close up the fields for a month may be a prudent measure. Ten acres of the grass land were seeded last year, and are not to be touched by my predecessor; so I will not be scarce of horse food at entry; but there is no restriction with respect to the remainder.

I have given directions to a neighboring tradesman to make ploughs, carts, harrows, &c. for me, all of the best quality. With regard to the plough horses, my father is clear that it will be best to purchase them at the fountain head, *i. e.* at the West-country market; though he says we may look at any roups at the time in the neighborhood, and see if any are there to be procured. In all these matters I shall be directed by my father. His advice shall never be disregarded; nor will I at any time act contrary to his sentiments. He knows business, and I am only beginning to learn it; though, with assistance from him and my *quondam* preceptor, I may in time be able to render similar aid to other people.

Upon looking over what is said, I find the thrashing machine on the premises has not been noticed. The machine is a good one, and in a complete state of repair; therefore I have offered to take it at the valuation of the celebrated Mr. Meikle; a person to whom agriculture is undoubtedly under the greatest obligations. My predecessor agreed to this proposal at once; adding that, from his personal knowledge of Mr. Meikle, he was sure the business was in good hands. You are also well acquainted with that ingenious mechanic; therefore I inform you, with pleasure, that a subscription has been lately opened *in his behalf*, under the auspices of Sir John Sincair, Bart., a gentleman well known to you, which promises to secure a suitable reward for the inventor of the thrashing machine, and the members of his family, that remain in an unprovided state. I do myself the pleasure of enclosing one of the subscription-papers; confident that every exertion will be made to fill it up in your neighborhood, so as the last days of a venerable and good man may be rendered comfortable and agreeable.

March 16.—So we cannot have your aid in settling matters with my predecessor. Surely, my dear sir, more than ordinary delicacy is felt, otherwise you would not decline acting as arbiter on my behalf, for no better reason than that I resided twelve months under your protection. The obligation then conferred was on your side, not on mine; and furnishes no cause for supposing that the strictest impartiality would not be exercised, when the duties of an arbiter were to be discharged. However, I am obliged to you for recommending another person for that office, and shall without loss of time wait upon him, and request his assistance.

April 16.—Grass-seeds were sown a few days ago amongst all the fallow wheat upon the farm; and I gave personal attention not only to the sowing of the seeds, but also to the harrowing process, during its whole continuance. My father, when I went to get that business executed, said to me, "George, remember to have the seeds well covered, otherwise an imperfect appearance of plants may be expected. I never saw a headland where the seeds did not vegetate well, owing entirely to the extra harrowing which that part of the field received; whereas, I have repeatedly seen other parts, even of the same field, imperfectly planted from a want of sufficient harrowing." Prompted by these suggestions, I took care that a close double time was given to every ridge; and insisted that the harrows should be driven smartly along, so as the full effects of the teeth, in loosening the surface, and covering the seeds, might be obtained. We sowed 40 acres, part with red clover and rye-grass, for soiling; and the remainder with white, red and yellow clover and rye-grass, for pasturage. A greater quantity of seed were given in the last than in the first instance.

The gentleman to whom you recommended me, undertook at once to act as arbiter in settling the several matters betwixt me and my predecessor.

He seems to be perfectly up to a business of that kind; for when I waited upon him with a copy of the submission, he immediately said, that, with the gentleman appointed on the other side, he would undertake to determine the respective claims in four or five hours. Surprised at this rapid mode of procedure, and knowing of some submissions which had been carried on *de die in diem*, I ventured to hint, that longer time might be necessary, to do justice to the parties. "Oh," said he, in an easy way, "I can readily explain the cause of the delay which you allude to. Those who were acting did not know the business entrusted to their decision, and of course halted at every step. People acquainted with such matters get more cleverly forward, especially if they have been often employed. In short, I pledge myself that a decreet shall be pronounced, at one sitting, upon every article in the submission shown me. Nay, I tell you plainly and candidly, that I have been engaged in more complicated submissions than yours, and spent less time in discussing them than what I have mentioned." Believe me, had not the gentleman been of your recommendation, I should have felt some apprehensions about the issue of the submission; but, recommended by you, every apprehension vanishes.

May 3.—The turnip break is cross-ploughed, and will next week be harrowed, rolled, reharrowed and hand-gathered; after which, the person, employed will give it a third furrow; in which state it must remain till I enter to possession of the farm. I have talked to him about cross-ploughing the plain fallow, and offered 14s. per acre if he will plough it nine inches deep. He does not seem averse to the offer, provided he can get on with his own business, which, he alleges, has rather fallen behind during the time he has been engaged with the turnip land. If he declines, I shall look out for some other person, being sensible of the great importance of stirring the fallows at an early period. The dung on the farm appearing to be imperfectly made, I proposed to my predecessor to have it removed from the courtine, or farm-yard, so as it may be properly piled up and mixed together; and offered to provide fillers, if he will furnish horses and carts. In fact, a removal is for both our interests. To him it must prove beneficial, because the dung cannot be accurately measured in its present situation: and to me the removal must be advantageous, because, without it, the dung can neither be properly rotted nor fermented. He has agreed to the proposal; and the removal is to commence on Monday, when all hands will be employed.

May 27.—I have now entered to possession of the farm; that is to say, to the grass and fallow land, and the dwelling-house, cottages and stables. My situation, at present, is certainly not a comfortable one; but in a few weeks, I hope matters will be suitably arranged. I purchased four horses at some roups in the neighborhood, and entered them this day to harrowing the turnip break, so as it might be prepared for a fourth furrow. I mean to set out for Glasgow fair to-morrow, to purchase six other horses; and next week the submission betwixt my predecessor and me is to be discussed. You therefore see that I will not be idle for some time. My father and another friend mean to accompany me to Glasgow; and after our return, you shall hear from me. Indeed, I have already received so much benefit from your instructions, that I would be callous to my own interest, were I to neglect any opportunity of seeking information at a source whence the ignorant may always be supplied without fee or reward. Yours, &c.

Class II.

June 3.—Upon my return from Glasgow market, where I had gone with my father and another friend to purchase horses, I was happy to find a letter from you on my table; more so, as the contents showed that you still retained the same partiality and kindness in my favor, as the tenor of your behaviour, since I had the good luck of being committed to your superintendence and management, had constantly evidenced. Allow me, my dear sir, to thank you sincerely for so many kind and affectionate advices. I shall treasure them up in my mind, and endeavor to exemplify the force of them in my daily conduct. Prudence and integrity are certainly qualities of the first importance. These qualities you warmly recommend, as tending to compensate for many imperfections. Though I may be two young to have full possession of the first, yet I hope the last has never been disregarded. Indeed, upon these two qualities, the real character of every man depends. Without the first, he is a fool; without the latter, he *may* be a rogue;—but, guided by both qualities, his actions must necessarily tend to promote his own happiness and the welfare of society.

But, to come to rural matters.—I am highly gratified by the approbation you are pleased to bestow upon the rotations of cropping submitted to your consideration in one of my former letters. In particular, I am well pleased that my father's observations concerning the increased and increasing benefits from grass-husbandry, are thought worthy of so much commendation. He has been a kind parent all along,—therefore merits from me not only profound respect, but also implicit obedience on all occasions. You justly remark, that the advantages of grass-husbandry will increase in direct proportion with the prosperity of the country, because the *general* taste of mankind is in favor of the use of *butcher* meat. This, my father says, is a sound remark, being justified by the experience of many years. He adds, when he commenced farming, that a beast or two, of thirty stones each, with a few half-fed sheep, fully supplied the weekly demand of the neighboring borough; but that now when the wealth of the country is so greatly increased, twenty or thirty beasts, and these of greater weights with a considerable number of well fed sheep, are required to supply the consumpt of the inhabitants for the like period. Indeed, should the wealth of the country increase to such an extent as to allow the lower ranks one meal of butcher meat per day, there is no saying to what length grass-husbandry may be carried. In my humble opinion, however, it should always be connected with corn-husbandry, and never exercised in an exclusive way, as customary in many parts of this neighboring kingdom.

We purchased six good horses at Glasgow market, none of them above six years of age, the average price of which amounted to fifty-five guineas or thereby. In point of expense, a good horse may be as cheap, if not cheaper maintained, than a bad one; therefore, the work of the good horse being of much greater value, it is for the interest of every farmer that the working stock should be fresh, strong, and capable of performing the labor for which they are intended. If horses are weak and feeble, work, ploughing especially, cannot be suitably executed; of course, either less ground is turned over, or a shallower furrow taken, which is almost the greatest evil which can befal an arable farmer. Indeed, if a weak horse requires as much corn and hay as a good one, common sense inculcates the utility of providing animals of the best quality. My father has always been very particular in these matters; and, I trust, has furnished me with a stock of horses capable of executing every branch of rural labor in the most advantageous manner.

The submission betwixt my predecessor and me, has been signed this day; and the arbiters are to proceed in discussing it to-morrow. They have chosen an oversman and a clerk, and summoned six witnesses, actual tradesmen, whom they mean to examine with regard to the condition of the houses and fences. I understand this is their usual mode of proceeding; and must acknowledge it seems well calculated to expiscate the truth. In that way, they have the whole benefit of the tradesmen's experience, without delegating any part of the power with which they are entrusted. In short, arbiters acting in this manner, may examine as many witnesses as they please, with regard to any particular fact or circumstance submitted to them; while the power of determining or judging upon the weight of the evidence, is still reserved in their own hands. I now begin to discern, that the gentleman to whom you recommended me was not wrong in affirming, that many arbitrations were kept up and delayed, because those employed did not know how to carry them into execution; and shall in my next fully explain the proceedings of the gentlemen appointed to judge of the various matters betwixt my predecessor and me. I expect my father this evening; and shall leave the agency of my claims solely to his guidance and discretion.

June 12.—Since the meeting of our arbiters, I have been so busily employed, as not to find leisure for transmitting, at an earlier period, a detailed account of their proceedings. Such an account may be useless to you, who have so often been employed as an arbiter; but I am sure it will be agreeable to learn, that the whole business was speedily finished; and, what is better, that it was finished to the satisfaction of the parties.

When the arbiters and oversman met, I was called, as incoming tenant, before them, and desired to state my claims against the outgoing tenant. My father, from a written paper in his hand, then stated the claims, namely, repairs of houses and fences; and expressed his desire that it should be formally ascertained, whether the full quantity of grass land and summer fallow was left upon the farm, and whether the clauses which respected management and cropping had been regularly implemented. The arbiters then called for my predecessor, and read over to him what had been urged by my father in behalf of the incoming tenant. To this it was replied by my predecessor, that he believed some repairs were necessary upon the houses and fences, the value of which repairs he was willing to pay; and that, with regard to the other prestations upon him, they were faithfully implemented. Moreover, he stated his claims against me, as incoming tenant, for the value of the land uncropped this season; of the ploughing given to it; and of the whole dung upon the premises. A minute of these matters having been made, the witnesses summoned were directed to examine the houses, and ascertain whether they were in the state and condition prescribed by the lease. Immediately thereafter, the arbiters and oversman inspected the fences, marking in writing, as they went along, the deficiences which appeared. They then desired the outgoing tenant to lead a proof that the farm was cropped, for *three years back*, according to the rules of the lease; which he having done to their satisfaction, the witnesses sent to examine the houses were called; and being interrogated upon oath, deponed respecting the repairs that were required. The dunghills were afterwards measured; and, before dinner, a decreet-arbitral was scrolled, and ordered to be engrossed upon stampt-paper. The substance of which is as follows:

The arbiters and oversman find, that the sum of forty-five pounds thirteen shillings and eightpence sterling will be required to put the houses upon the farm of —— in the condition prescribed by the lease. Find that the sum of eighty-three pounds nine shillings and three pence sterling will be required to put the fences and gates upon the said farm in the like condition; which sums, amounting to one hundred and twenty-nine pounds two shillings and elevenpence sterling, they decern and ordain to be paid, by the outgoing to the incoming tenant, at Lammas first to come, with legal interest from that date, in case of non-payment. Find it established, that the full quantity of grass-land and summer-fallow, mentioned in the tack, has been left upon the farm; and also, that the said farm has been managed and cropped, according to the rules and obligations of the tack; therefore, decern accordingly. Find, that the value of the land left uncropped this year as a turnip or fallow-break, at the rate of three pounds ten shillings per acre, is one hundred and seventy-five pounds; which sum, they decern and ordain to be paid, by the incoming to the outgoing tenant, at Whitsunday next, with interest from that date, in case of non-payment. Find the value of one furrow given to the said fallow to be twelve shillings per acre; and that the amount of the same is thirty pounds sterling. Find, that the quantity of dung left upon the farm, and produced from the penult crop, is nine hundred and forty cubic yards, but, in respect the outgoing tenant could not reap more than one year's benefit from that dung, find him only entitled to be paid for it as a cottar. Find, therefore, the value of the dung, at the rate of two shillings and sixpence per cubic yard, to be one hundred and seventeen pounds ten shillings; which two sums of thirty pounds and one hundred and seventeen pounds ten shillings, amounting, in all, to one hundred and forty-seven pounds ten shillings sterling they decern and ordain to be paid by the incoming to be outgoing tenant, at the term of Lammas next, with interest from that date, in case of non-payment, &c. &c.

Thus, a business is settled, which gave me at first some uneasiness. The whole expenses thereof amounted exactly to ten guineas, the arbiters having declined receiving any payment for their trouble. They ordered six guineas to be paid to the gentleman who acted as their clerk, for stamps, and writing the submission; and award one guinea to a landmeasurer who ascertained the quantity of dung; and half a guinea each to six tradesmen summoned as assessors; which sums were paid by my predecessor and me in equal proportions. After business was despatched, the arbiters and oversman did me the favor of taking a share of dinner amongst with my father and the outgoing tenant, together with the clerk and landmeasurer. I find the latter to be a decent and discreet man, an excellent figurer, and one who understands measuration in all its parts. On these accounts I mean to give him all the countenance and employment in my power. We spent the afternoon agreeably, and did not forget to drink your health. My predecessor behaved very handsomely through the whole arrangement. In short, without showing the least ill-will or spite to me, because I am his successor, he has, from first to last, acted like a gentleman, and as one who knows the world. He has never ostentatiously professed to serve me; but, on the other hand, has as seldom thrown cold water on any part of my proceedings. I am so much satisfied that good agreement betwixt outgoing and incoming tenants is for their mutual advantage, that I mean to meet him more than half-way in every matter which may occur, till his crop is harvested and marketed. In these processes, it is in my power to serve him materially.

The turnip field is now ready for sowing, having received five ploughings, the last across, (which my father strenuously recommended as the best method preparatory to forming the drills), with repeated harrowings and rollings. It is perfectly clean, and completely pulverized; but I am afraid that brairding sap may be scanty, from the severe drought which has for some weeks prevailed. I should have mentioned that one fourth of the field was sown last week with ruta baga and yellow turnips, having, *per* favor of my predecessor, obtained as much dung as was required to supply that part of the field, though the arbiters had neither valued nor measured it. The number of cart loads drove out were ascertained; and it was agreed that each cart load should be considered as containing one and three quarter cubic yards, and paid for accordingly. This is one instance of the benefit which may be done by an outgoing to an incoming tenant; for, assuredly, had my predecessor drawn cross, I could not have got either ruta baga or yellow turnips sown in proper season. My father is a great advocate for yellow turnips, saying, they possess all the qualities of ruta baga, and are much easier produced. He seems to think, that a full crop of ruta baga can only be obtained from ground, either naturally of very fine quality, or which has received a large supply of dung. The advantages of ruta baga are, resistance to the severest frost, and supplying food for cattle and sheep, after common turnips are consumed, and till the grass season arrives. Similar advantages, my father says, may be procured from yellow turnips upon inferior soils, and with less expenditure of manure. These matters, I hope, ere long, to be able to speak upon, from practical experience.

Though the utmost care has been taken to feed the horses well, and not to push them too fast, I find those bought at Glasgow are rather getting into a backward state, being duller in the eye, drier on the skin, and not feeling so plump and mellow as when they were purchased. The horses bought at country roups have not fallen off in the least, though equal work and treatment has been given the whole stock. Shall I attribute the difference of condition to the west country horses not being formerly kept upon the same sort of food as given to them here; or must I suppose, that, at home, they were gently worked, and not used to nine hours per day in plough and harrow, as has regularly been the case (Sundays excepted) since they were purchased? Each of them have got nearly one third of a firlot, or twenty-one pounds weight, of good potato oats, and one and a half Scots stones, or thirty-three pounds weight, avoirdupois, of hay every day since they came into my custody. I purchased the oats at 28s. per boll, and the hay at one shilling per stone; so, of course, the expense of their maintenance has not been less than four shillings per horse per day. I have now begun to give them cutting grass instead of hay, though I do not think it would be prudent to withdraw any part of the corn till the sowing of turnips is concluded.

My establishment (perhaps the term is an improper one, when applied to the servants of a farmer, though used in a pamphlet lately published) consists of my sister, who has kindly undertaken to manage the house till a better manager can be procured, a maid-servant, and a boy to clean my saddle-horse, and perform odd jobs. The ploughmen and laborers are married men; and all of them have behaved steadily and decently since they entered to my service. They leave the stable at five o'clock in the morning, and it generally is half-past ten o'clock before they return; as my orders like your's, are, that the yoking is to commence when they put the plough in motion, not when they go out of the stable-doors. In the afternoon, they leave the stable about twenty minutes before two o'clock, and go four hours after the plough is set to work. Now, when the horses receive grass, the ploughmen have to bring it from the field betwixt yokings, it being cut and tied in bunches by one of the laborers, which, as you often told me, are most saving operations. In fact, where such management is neglected, a great waste and an irregular supply are the necessary concomitants, though, where attended to, the horses are supplied in a regular and economical manner.

June 17*th*.—The sowing of turnips is now finished, and fine dry weather was enjoyed during the whole of the process. I could not, like you, carry on the forming of drills, dunging the ground, splitting the drills, and running the seed-machine, all at one time; but I did the best in my power which circumstances would permit: *I formed* a considerable number of the drills beforehand, employing three carts in driving out the dung, two *ploughs* covering it in as fast as it was *spread*, while, with an odd horse, the drill-machine regularly deposited the seed. I made it a point, that a *single* drill was not to remain uncovered at the end of the yoking, and took equal care that none were left unseeded; as I hope the best was *done* under the circumstances of the case. When the drills previously made had been dunged, the whole strength was employed to form *additional ones*; and, by acting in this way, and paying constant attention to the work while it was executing, I hope a regular braird may be procured, notwithstanding of the uncommon dry weather which has lately prevailed. I might have mentioned, that two additional laborers were engaged for filling the dung-carts, as one of my own was employed to manage the seed-machine, while the other was cutting grass, and at other jobs. The dung was spread by five boys, who, after the first day, did it very well with light grapes, which I got made on purpose for that operation. At first, they rather appeared to do the work imperfectly; but upon offering a premium of half a crown for the best spread drill, their attention was immediately excited, and a competition ensued, which afterwards was attended with the most beneficial consequences.

The ruta baga and yellow turnips, sown about two weeks ago, have brairded pretty regularly, and must soon be scraped by the Dutch hoe. These were drilled at intervals of two feet, as the plants, not growing so large as common turnips, do not require intervals of the like size. The summer fallow is now to receive the third furrow; previous to which, I mean to harrow and roll it well. Owing to the severe drought, the ground is very dry, and will require the heavy stone-roller to reduce it sufficiently. After rolling, my intentions are to harrow again; then hand-pick all the quickens, &c. that may be brought to the surface; and these operations being over, the ploughs will be entered, and the ground ridged up as expeditiously as possible.

June 30th.—Many thanks to you for the shrewd and kind advices contained in your last. You caution me against keeping much company; alleging, justly, that great expense is not only incurred by such conduct, but that a farmer's mind is thereby abstracted from the regular management of business. On these matters, my sentiments are precisely the same with yours. Indeed, I have often wondered at seeing some of my friends so eagerly set upon giving and receiving visits, as scarcely to have a whole day for the guidance and superintendence of their own affairs; and have entertained doubts, whether such persons were influenced by the enjoyments of the table, or the pleasures of society, to imitate the higher ranks, who, having little or no real business to occupy their attention, are necessarily influenced to devote the greatest part of their time to the enjoyment of social life. The man of business, however, is differently circumstanced. With him every moment is precious. If he spends time in idleness, his private affairs must suffer. His income depends, in a great degree, upon his own exertions; and, if these are weak, irregular, or misapplied, his resources must proportionally be dried up and lessened. Let any man reflect, whether, after spending one-half of the day and a part of the night in company (a custom now too prevalent), a farmer can have the same disposition for business in the morning, as if the preceding day had been spent in following the duties of his profession, and the night in refreshing his body by rest and sleep. Surely he cannot; and, if so, his business must, in one way or other, be thereby injured. Besides, the racket of company is inconsistent with the domestic economy of a farmer's house. It occasions his family to be neglected; throws his household affairs into confusion; takes his servants out of their proper sphere; adds greatly to his expenditure; and, in short, places him in a situation inconsistent with the real welfare and happiness of those engaged in the rural profession.

Mistake me not, by supposing I am hostile to social enjoyment; nor think me so cynical as to condemn every relaxation, as a departure from the rules of regularity and business. No person likes better to see a few friends than I do; and, short as the time is that I have kept house, most of my parochial neighbors have already taken a share of dinner with me. It is not the moderate enjoyment, but the abuse of social pleasures, against which I contend; where visiting is regarded as the chief business; where eating and drinking is considered as the *summum bonum*—and where the principal care of one day is concerning the dinner of the next. Surely I am right in reprobating and condemning such preposterous conduct. Indeed, my sentiments concerning these things were learned at your house. When under your charge, I noticed that the pleasures of society were not disregarded, though, to your praise be it said, the cup was never emptied to the last dreg. Your entertainments were arranged in such a way as not to interfere with professional duties; particularly, I must remark, that, in seed time and harvest, you seldom considered the visits of your friends as a relaxation from business. Nay, if I am not mistaken, you one day declared, that a ticket, at these periods, should be affixed upon every farmer's gate, containing these words, "No admission here." According to your system shall my conduct be squared. I will see my friends with pleasure at convenient periods, and repay their visits in the same way, without considering the business of so much importance as to keep a debtor and creditor account of it. I will constantly endeavor to preserve regular hours; and, above all, avoid the absurd practice recently introduced, of dining at the same hour as the ancient Romans supped. Common sense declares early hours to be best for those engaged in the rural profession. The attentive and diligent farmer will rise equally early with his servants, at least, for a considerable part of the year; but early rising and late upsitting are at utter variance. In short, it is my firm resolution never to sacrifice the duties of one day for the pleasures of another. Having once got into the right road, perseverance will only be required to preserve me from wandering out of it. At my time of life, sedulity and attention to business ought by no means to be disregarded; as inattention to these qualities may engender habits afterwards not easily overturned.

The turnips have not vegetated so regularly as might be wished, though I am inclined to think the plants are sufficiently numerous to make a crop. The ruta baga and yellows are set out, and once horse-hoed. These crops are thriving and regular; and, being the first that I have cultivated on my own account, the sight of them affords me great satisfaction. The fallows are all ridged up, and seem tolerably clean. I am now driving lime for one field which does not seem to have received calcareous matter for many years. I find, that, for prime cost and carriage, the expense of liming will not be less than ten pounds sterling per Scots acre.

July 28.—I took your advice, and shut up the grass fields for a month after my entry to the farm, as they were completely eaten up by the bestial of my predecessor before his departure. For the first twenty days little difference of growth appeared; which inclines me to think, that the eating of grass land, in the spring quarter, when the weather is cold and blasty, is highly pernicious and destructive. About the end of the month, however, some soft genial rains having fallen, the fields assumed a fine verdure; and a full bite was shortly thereafter obtained. My father sent me half a score of Highland cattle, and recommended, that I should attend some of the neighboring markets, and endeavor to purchase such further stock as might be wanted. Accordingly, I attended the fair at ——— and having pitched upon eight decent three-year old country stots, which might be partly fed in summer, and completed upon turnip in winter, I ventured to request the opinion of a celebrated and well known grazier, concerning their value. His reply mortified me exceedingly, especially as it was delivered so audibly, that one-half of the market might have heard it. "What," cried he aloud, "does the apprentice of the great Mr. Jamieson stand in need of the advice of a hobledehoy like me? Go back to Barnhill, and complete your apprenticeship." Touched to the quick by such a sarcastic reply, I turned about, and left the *gentleman*; and, though dubious of possessing sufficient skill, ventured to conclude the purchase upon the lowest terms that could be made with the seller. Since that time, my father has been here, and assures me that the bargain is a very decent one; which is satisfactory information.

The working horses remain in middling condition, notwithstanding they have been twice each day fed with oats since the turnip sowing was finished. The clover grass is rather getting coarse, which is much against them, and in all appearance it will be fully three weeks, before the second crop is ready for the scythe. I feel the want of tares—an article of horse food indispensably necessary at this period of the year; but next season, shall take care to provide an abundant supply. Where tares are neglected, the deficiency may be made up, by pasturing a piece of the clover field for ten or twelve days, at Whitsunday or the first of June; in which way fresh grass may be obtained, at the time when tares are required. A farmer in the neighborhood followed the plan mentioned; and, at this time, has soft young grass for his horses, whilst mine is hard, coarse and unpalatable. The seasoned horses purchased in the neighborhood, have all along kept in better condition than those brought from the west country.

One of the fallow fields of the thin clay soil, has received dung, and was ploughed thereafter as expeditiously as possible. This field contains 14 Scotch acres, to which 168 carts of dung were applied, and seems to be in excellent condition. I have cleared out the headland and *gau* furrows, in case the usual Lammas flood shall follow; and, if weeds do not appear, mean to sow it with wheat, in the first week of September if possible. Should it take on the slightest growth before that period, I will give another ploughing; though, being well rounded up, I would rather wish to sow it upon the present ridge. The other fallow fields are to be dunged immediately. Respecting this branch of work, the injunctions of my father are very particular. He repeatedly told me when here—"Take out your dung to the fallows about the first of August, or thereby, if practicable; draw it equally out of the cart, and spread it without delay. Plough the land without loss of time after the dung is applied, taking care that an equal furrow is given to every part of it, and by no means neglect to spade and shovel the head land and cross furrows, even though the weather at that time be steadily dry; as a heavy loss, at least a great inconvenience, is often sustained, from a want of attention to these 'seemingly trifling matters." With the assistance of the stable dung made through summer, I believe we will be able to manure the whole of the fallow. You may likely think that the summer dung will not, at this time, be ripe for use; but I have the authority of the celebrated Mr. Professor Davy, for using *long* dung, which may save me from censure when acting contrary to the established practice.

(To be continued.)

MR. JAMIESON'S FARM.

To the Editor of the Farmers' Register.

As a Scotchman, I feel a considerable degree of interest in the extracts from the agricultural periodicals of my native country which frequently appear in the pages of the Register; and the "Letters from an agricultural apprentice to his father" copied from the 'Edinburgh Farmer's Magazine,' which appeared in the numbers of the Register for Sept. and Oct. have been peculiarly interesting, from the strong conviction on my mind of my having in early life known the farm, the management of which these letters so well describe. The name of the farm, the farmer, Mr. Jamieson, and at least two of his managers (Elliot and Fairbairn), together with the whole tenor of these letters, convince me that I am not deceived. The farm to which I refer is situated in Roxburghshire (Scotland) on the south bank of the river Tweed, a few miles from the market town of Kelso, and had been formed by the junction of a number of small holdings or farms, and consisted of upwards of two thousand acres. The junction of these farms had taken place before I can remember; but I have often heard comparisons made between the comparatively unproductive state of these farms before their union, and the high degree of fertility to which they subsequently attained, after being united and occupied by a wealthy, enterprising, and systematic farmer. The place of my birth was two miles lower down the same bank of the Tweed from this farm. My father left that part of the country when I was very young, making however annual visits to his relatives in that neighborhood, in which I frequently used to accompany him. The last time I was on this farm was in the autumn of 1824. It was then in the occupation of a new tenant, paying a yearly rent of £8000. Harvest was at the time of my visit nearly completed; I however counted 140 shearers (reapers) in one field of oats. I had also an opportunity of seeing the stack-yard just after the stacking of the grain was completed. A more imposing agricultural spectacle I believe I never witnessed. The number of stacks I do not now recollect; they were certainly not under one hundred, ranging in parallel rows, and raised from the ground on short pillars, large, and finished with the greatest degree of neatness. I have oftener than once traversed the principal agricultural districts of Scotland south of the Grampian hills, and in which I have seen many well and neatly conducted farms, but none equal to this in magnitude, or surpassing it in neatness. The change of occupants had also made some alteration in its management. Naked fallows had been nearly if not altogether abandoned. Turnip husbandry had been greatly increased; and these consumed on the land by sheep. Every thing however evinced the best of management. The same bell summoned the laborers to their work; and all the minutiæ of good management and division of labor appeared to be as strictly attended to as in the time of its former systematic occupant.

ANDREW NICOL.

Coggin's Point, Nov. 8th., 1839.

IMPORTANT TO FARMERS.

From the Sangamo Journal.

There are few of our farmers who have not witnessed the effects among cattle of a disease known as the *mad itch*. It has sometimes carried off the most valuable stock; and all efforts to arrest the disease appeared to be useless. We think we can now lay before our stock raisers a remedy for this disease. It was discovered by Mr. David Simms, a farmer, living on Lake Fork. Considering it valuable to the public, he has handed us the annexed notice of it for publication. We would suggest to our farmers to preserve it, as it may prove of more value to them than the amount they would be required to pay for a dozen volumes of the Journal:

To the Editor of the Sangamo Journal—

The undersigned takes this method to inform the farmers and all those who raise cattle, that he has discovered a cure for the mad itch, a disease which is often fatally destructive to that species of stock. Last winter was two years, when I had four cows attacked with the above complaint, and I tried every thing I could think or hear of, to cure them, but with no good effect. This winter another of my cows took the same disease, which I discovered early one morning; and as soon as I discovered it, I gave her as much soot and salt as she would lick, and in a few hours after, I gave her from three quarters of a pound to a pound of pulverized brimstone. In the morning following, I gave her as much salts. The cow is now well, and is as hearty as any of my cattle. It is my opinion that sulphur itself will cure, or sulphur and salts given in the way prescribed. The cure was effected in about a week. The remedy operates severely for two or three days as a purge.

To those who are not acquainted with this disorder I will inform them that it first comes on with a kind of hiccoughs or jerks at every breath. The brute jerks itself full of wind; frequently licking their sides and back; occasionally rubbing their heads; and if not stopped, in five or six hours they rub with apparent madness, and continue to swell until death takes place which will be within about ten or twelve hours after the attack.

This cure is from experience, and I give it for the good of my fellow-citizens.

DAVID SIMMS.

Logan Co., 15th March, 1839.

For the Farmers' Register.

THE WEATHER IN TROPICAL FLORIDA, DURING THE SEMINOLE WAR.

Abstract from the Meteorological Register, kept at Indian Key, Tropical Florida, by Charles Howe, esq., P. M., and inspector of the Port. Thermometrical observations made at sunrise and 2 P. M., each day.

	The coldest day at sunrise.	*The hottest day at 2 P. M.*	*The greatest variation in one month.*	*The greatest variation in one day.*	*The least variation in one day.*	*No. of days in which rain fell.*	*No. of inches of rain fallen monthly.*
1836							
January	54	77	23	9	0	1	2.
February	50	81	31	11	0	1	0.64
March	60	80	20	9	0	3	2.50
April	71	83	12	5	0	4	2.
May	75	84	9	6	0	5	6.50
June	78	88	10	8	0	4	3.50
July	77	86	9	4	0	3	5.34
August	80	86	6	6	0	4	1.69
September	80	86	6	4	0	13	0.90
October	74	85	11	4	0	2	3.86
November	62	80	18	7	0	1	1.22
December	60	78	18	10	0	0	0.
1837							
January	50	84	34	11	2	6	3.72
February	51	80	29	10	1	3	1.10
March	59	82	23	10	1	1	0.09
April	65	86	21	9	2	3	2.
May	72	88	16	10	0	3	0.90
June	76	90	14	9	2	2	3.10
July	79	90	11	7	0	4	4.70
August	78	90	12	6	2	5	6.75
September	79	88	9	6	1	3	8.25
October	61	88	27	6	1	5	8.75
November	61	87	26	9	0	2	6.10
December	62	84	22	9	2	3	2.12
1838							
January	64	82	18	7	1	1	0.20
February	50	83	33	14	2	2	0.06
March	62	82	20	10	1	1	0.30
April	64	84	20	11	2	1	1.08
May	70	87	17	10	2	3	2.10
June	76	88	12	8	0	6	7.
July	80	90	10	7	2	1	2.40
August	82	90	8	6	2	2	3.
September	78	89	11	6	1	8	7.10
October	68	86	18	10	0	5	6.22
November	67	84	17	8	0	3	7.10
December	63	84	21	12	0	3	2.60
1839							
January	54	80	26	12	0	2	0.08
February	61	84	23	12	1	4	0.12
March	59	84	25	10	1	1	0.02
April	58	87	29	12	2	4	3.
May	76	88	22	9	0	11	6.90
June	79	90	11	6	2	8	4.50
July	80	89	9	7	2	8	7.60
August	81	89	8	7	1	6	2.60
September	78	88	10	7	2	4	6.50
October							
November							
December							

General Results.

	1836	1837	1838	Oct. 1st. 1839
No. of clear days in the year	289	290	314	210
" of cloudy " " "	35	35	15	15
" of rainy " " "	41	40	36	48
Extreme hottest day "	88°	90°	90°	
" coldest " "	50°	50°	50°	
Greatest change in 1 month	31°	34°	33°	
Greatest change in 1 day	11°	11°	14°	
Number of rainy days in each rainy season, from June 1st, to October 1st, each year	24	14	17	26

That is, the number of days on which showers fell; because there is never an entirely rainy day; and because the showers mostly fall by *night.*

N. B.—In the first nine months of the present year, it should be noted that the showers have been uncommonly numerous, and have occurred at unusual times. H. PERRINE, M. D.

Indian Key, October 15th, 1839.

To the Editor of the Farmers' Register.

Indian Key, Trop. Fl. Oct. 15, 1839.

SIR—I gladly transmit to you an abstract of the Meteorological Register kept at this islet during the whole period of the Seminole war, by Charles Howe, esq., P. M., and inspector of the Port. These undisputable evidences of the usual weather in Tropical Florida ought to demonstate that, *in South Florida*, military hostilities against the savage Seminoles could have been continued throughout the whole summers as well as at all other seasons of those years, from the first of January, 1836, to the first of October, 1839. You know, that the highest official authorities of the republic have adopted the deadly "opinion," that the territory of Florida is cursed with a "deadly climate;" and that the most vital interests of the nation must continue to suffer from the continuance of this "deadly opinion." As a physician, then, it has become my duty, 1st, to re-affirm boldly the positive fact that below 26°, South Florida, with its peculiarly tropical atmosphere, enjoys the most healthy climate in the United States; 2nd, to announce strongly the additional fact, that South Florida, *with its exclusively calchreous earth*, possesses also the *most healthy soil* in the United States; and 3rd, to invite earnestly my medical brethren to publish speedily every fact, and every argument which can be brought or which may be thought to show that either in climate or in soil, South Florida is not the healthiest district of the union!!

Very respectfully,
Your ob't. serv't.
HENRY PERRINE, M. D., &c.

P. S.—The Meteorological Register, above, will demonstrate to every intelligent physician, the unrivalled healthiness of the tropical climate of South Florida; and to every comparing observer, the unrivalled delightfulness of its equable weather at all seasons of the year! H. P.

CONTRASTED CLIMATES OF SOUTHERN FLORIDA AND OF SOUTHERN MISSISSIPPI.

To the Editor of the Farmers' Register.

Having noticed in the 'Journal of the American Silk Society,' at page 152, a paragraph headed "Climate of Mississippi," which appears to contain the general results of observations on the weather made in Natchez, I suggested to one of my children the expediency of making a similar compend from the meteorological registers of Indian Key for the same years of 1837, 1838, kept by Charles Howe, esq. Although I practised medicine myself in the neighborhood of Natchez, from June 1824, to March 1826, the contrast between the two climates of southern Mississippi and southern Florida appears so very extraordinary, *even to me*, that I think it merits to be presented to the public in general through the pages of your Register, in the form of the parallel tables here subjoined.

Respectfully, &c.
H. PERRINE.

Indian Key, T. F. 1st *Oct.* 1839.

1837	Natchez, Miss.	Indian Key, T. F.
Clear days	95	290
Cloudy	166	35
Rainy	93	40
Foggy	4	
Hazy	5	
Snowy	2	
Coldest day, at	6 P. M. Jan., 28°	At sunrise, Jan., 50°
Hottest day, at	6 A. M. Aug., 93½	At 2 P. M. July, 90°

1838	Natchez, Miss.	Indian Key, T. F.
Clear days	43	314
Cloudy	193	15
Rainy	93	36
Foggy	27	
Hazy	5	
Snowy	3	
Sleety	1	
Coldest day at	6 A. M. Feb., 18°	At sunrise, Feb., 50°
Hottest day at	6 P. M. June, 94°	At 2 P. M. July, 90°

NEW SPECIES AND NEW VARIETIES OF THE ACTUAL STAPLES OF THE OLD SOUTHERN STATES.

To the Editor of the Farmers' Register.

In my official letter to the Hon. Secretary of State of the U. S. A. dated at Campeachy, 9th December, 1834, the following *sentence* was incidentally introduced. "Were there however no other motives for an acclimating nursery in Tropical Florida than the domestication *of such species* and varieties of rice, tobacco and cotton, as are peculiarly valuable in peculiar soils, and of such as will flourish in sites and seasons where and when the actual species or varieties would perish, such an establishment should be encouraged on that account alone." The above extract is transmitted for the effective consideration of the enlightened planters of the south, because *your pages contain* notices of two new species or two new varieties of cotton, which already have *been casually* introduced; and because I am persuaded that still more valuable species or varieties may be immediately domesticated in Tropical Florida, and thence gradually acclimated throughout all our southern states. We are told, by Thomas Spalding, that our celebrated sea island cotton was first procured from the small island of Anguilla, and domesticated in the Bahama islands; and that from the *arid rocky* soils of the Bahamas it was introduced directly into Georgia in 1786. We are further told that his father planted his *Anguilla-Bahama* cotton seed in the spring of 1787 upon the *banks* of a small *rice* field in St. Simon's island; that the land was *rich* and *warm;* that the plants grew *large* and *blossomed*, but did *not* mature their fruit. That nevertheless *the plants grew from their roots* the following year, and *matured their bolls;* that the difficulty was then over; that the cotton adapted itself to the climate; and that every successive year from 1787 saw the *long staple cotton extending itself* along the shores of Georgia, and into South Carolina. By the letter of the same gentleman it appears, that subsequently "every variety of cotton that could be gleaned from the four quarters of the globe has been tried; but none of them, but *one*, has resulted in any thing useful;" that the *Bourbon* cotton grew and blossomed, but did not ripen its fruit, and perished in the winter; that the *Siam* cotton grew large, was of a *rich purple* color both in *foliage* and *blossom*, but *perished* also without ripening its fruit. "The *kidney seed* cotton (that is, a cotton which produces the seed *all clustered together* with a long strong staple extending from one side of the seeds, and which I believe to be the Brazilian or Pernambuco cotton,) was tried, and was the only new species upon which there could have been any hesitancy; but this, too, was given up, because *not* as *valuable* and not as *productive*." As the last phrase is comparative, we should infer that Mr. Spalding meant that the *kidney seed* cotton was not then as valuable or as productive as the *sea island* cotton, when raised on the same warm *rich soils*. But by the 'Southern Agriculturist,' of December, 1838, we see, that *now* the southern planters say, that at even from 70 to 80 cents per pound for sea island cotton, its culture is less profitable than the raising of the *hardy* and *productive* kinds of *common cotton;* that its average price in Liverpool from 1830 to 1835 was only 17¼ pence; and even during 1836–7 rose only to 25 pence, and that the average crop of 1837 was only 76 pounds per acre, and in 1838 would not probably exceed 64 pounds per acre. Has not therefore the period arrived when it is desirable to give the kidney seed cotton *another trial*, not on the *moist rich* soils adapted to the sea island cotton, but on the *driest poorest soils* of the *old* southern states? (In asking this question I wish to be distinctly understood that *I have no seeds* of any kind for sale, and very few for exchange. No person who understands my past history, and my present circumstances, will suspect me of either the capacity or the desire to engage in any pecuniary speculation; but the writers on the manilla mulberry have caused their readers to be distrustful of every agricultural novelty.) On my first arrival at Campeachy in 1827, I was shown, in the yard of Colonel Toro, a shrub of the kidney seed cotton, which was still bearing cotton on my last departure in 1837. Dr. Corroy, of Tobasco, a small state adjoining Yucatan, informed me that the same perennial shrub continued to yield cotton abundantly during eight months of every year. Under date of the 12th of January, 1834, at Campeachy, I noted "the pods are so numerous and so heavy that they bend the branches towards the ground like an over-loaded peach tree." Under date of 5th of December, 1835, "I have collected some ripe pods. It is a custom here to cut down the stems in May in order to have new shoots during the rainy season." I continued to send seeds every year to many parts of the United States, but never received any accounts of any trials made with them. Finally in the spring of 1833 several seeds from Campeachy, via Havanna and Key West, were so lucky as to reach Cape Florida; and in that vicinity, I am informed, that their progeny are still propagating themselves. Indeed on the 16th September last, while on a brief visit to Big Pine Key, south-west of Cape Sable, a Mr. Williams showed me a shrub of the kidney seed cotton growing there, which sprang from seeds given to him by Mr. Dubose, the former keeper of the light house at Cape Florida, to whom my seeds and plants from Yucatan were intrusted. To guard against all contingencies however, I brought fresh seeds with me to Indian Key in July, 1837, of which some were sown in August, in a single box not containing more than a cubic foot of earth. On my return to this islet, the 25th December last, I found six strong stems growing in that single box, the branches of which were covered with ripening pods; and on the 7th of February, 1839, the first boll of mature cotton was picked by me; and on the 11th it was sent (by the schooner Hope for Charleston, S. C.) to the Hon. H. L. Ellsworth, commissioner of the Patent Office at Washington. *Suffice these details to prove that the perennial kidney seed cotton of Yucatan is now permanently domesticated in Tropical Florida!* I have previously notified you of the fact that while at Northampton, Mass., during September, 1838, I obtained a few seeds of an apparently *silkier* variety of the kidney seed cotton, brought by a Mr. Peck from the Sandwich islands; that one of the Sandwich seeds, sown in a tub of earth on the 19th July last, had grown by the 11th September to the height of nearly two feet, and was then discovered to have five flower buds; and, I now add, that the first blossoms opened the 23rd September, the 2nd the 25th, 3rd the 27th, the 4th the 30th, the fifth blossom on the 2nd October, the sixth on the 5th. A record of these details will be appreciated only by those who can imagine the great results to our southern states, which may ensue if this single plant shall mature its wool and seeds in the short period of time which will enable it to be cultivated as far north as the common annual cotton. One object of my ambition is to have a few plants of every species and variety of cotton growing in the same nursery. This desire is not founded on the mistaken opinion that any kind of capsular fibres can ever be produced as profitably as foliaceous fibres, in Tropical Florida. It is very evident that no annual plants can ever be profitably cultivated on a large scale, *on any* of these *arid rocky keys*. 1st. Because they will not admit the labor saving agency of the plough. 2nd. Because they are composed of the single element of carbonate of lime, and as the scanty substance, here called *soil*, consists solely of fine calcareous powder colored with a little vegetable mould, it is *destroyed* by a *few years exposure* after clearing; for the mould is soon decomposed by the sun, and the powder is blown away by the wind. Yet for the same reason, that the perennial *silk* shrubs are adapted to small cultivators on these rocky islets, the perennial cotton shrubs, and the perennial hemp plants, are also adapted to both. But my desire to have every species and variety of cotton in a tropical nursery are founded on the opinions of their ultimate utility to the poorest soils of the southern states, expressed in the cited paragraph to the Secretary of State. Had such a nursery existed 50 years ago, when every variety of cotton was gleaned from the four quarters of the globe, what imagination can calculate the probable results of their preservation, propagation, selection and improvement, to the present date! The *Bourbon* and the *Siam* cottons would have had another and repeated trials, until they too, like the sea-island cotton, might have adapted themselves to different climates and soils of the southern states. Indeed the principal causes of the general failures in all first trials to acclimate tropical plants may be traced to the general practices of planting and protecting them in *warm and rich soils.* In Mexico, in the state of Vera Cruz, near the village of Cosomoloapam, there grows a *rose colored cotton*, which Don Domingo Barret, of Campeachy, assured me he had personally seen; but although during several years I offered a doubloon for a single pod, I was never able to obtain a single seed. From Campeachy I frequently transmitted to different ports of the United States the "Algodon de vejuco" or reported *vine cotton* of the stony hills in the interior of Yucatan; but know nothing of the results, unless they were contained in the following paragraph of the 'New York Evening Post' of August 12th, 1835, extracted from the 'Charleston Courier,' "Productive cotton. Two very fine specimens of a sea island cotton, grown on James Island, have been left at this office for inspection. This plant shoots up in a kind of *vine*, and is *exceedingly productive*, as testified by the numerous blossoms and pods which the specimens before us exhibit." As the first parcel of these *vine* cotton seeds were the only ones that I could obtain from the interior of Yucatan, the balance brought with me to Florida in 1837, had probably lost their vitality during the intervening years, because not a single seed has yet germinated, although I have made many trials. As the introduction and propagation of tropical plants *direct* from the tropics, cannot be accomplished by either private individuals or chartered companies so long as even our armies cannot afford protection to the persons or pursuits of agriculturists in southern Florida, and so long as ports of entry be not established at or near the southern extremities of the peninsula, my time can be usefully employed only in making a miniature collection of the very few tropical plants or seeds, which may be obtained by the only opportunity offered by the monthly mail packet from Charleston, S. C. I therefore respectfully suggest to the intelligent planters of the south the propriety of speedily procuring and transmitting to me a dozen seeds of each species and variety of cotton, for which I will return to them any equivalent in my power. As the very enlightened Commissioner of the Patent Office has practically commenced an agricultural department by affording facilities for the collection and distribution of valuable seeds throughout the United States, the *trouble* of transmitting to or receiving from me a *few seeds* will be very *slight* indeed; as it will consist solely in first superscribing the small package "to the superintendent of the Tropical Plant Company, Indian Key, T. F." and then enclosing it in an envelope directed to the "Patent Office, Washington, D. C." Very respectfully,

Your ob't servant,
Henry Perrine,
Sup't. T. P. C.

Indian Key, T. F., 5th *Oct.*, 1839.

REAFFIRMATION OF CHARGES IN DR. PERRINE'S COMMUNICATION.

To the Editor of the Farmers' Register.

Indian Key, T. F., Oct. 15th, 1839.

In your August No. at p. 473-4, I perceive, over *two names*, the irrelevant attempts to impeach the *phraseological* correctness of two words contained in a few forbearing lines, (on p. 364-5 of your June No.,) *which cannot ever be fairly disproved.*

On these self-exculpating, self-implicating papers, of offending and offended individuals, I merely remark that they do not even indirectly deny the main fact of *gross neglect of official duty;* and I briefly add, that a recent outrage personally perpetrated by the primary defendant, having been formally communicated to the Hon. Secretary of the Navy, the sub-officer should soon have an *official* opportunity for official disproval of any official misconduct ever alledged by me.

Very respectfully,
Your ob't. servant,
Henry Perrine.

CORRESPONDENCE ON THE PRESERVATION OF TROPICAL PLANTS.

[Communicated for the Farmers' Register.]

War Department, July 13th, 1838.

Sir—This will be handed to you by Dr. Perrine, who repairs to Florida with a view to the accomplishment of important and interesting objects, which he will make known to you. Such aid and facilities as you may be able to extend to this gentleman, without any interference with the particular duties with which you are charged, under the direction of this department, I will thank you to grant him. Very respectfully,

Your most ob't. servant,
J. R. Poinsett.

Lieut. J. T. McLaughlin,
Commanding Schr.' Wave.

Circular to the Officers and Agents of the War Department, in and near the territory of Florida.

Such officers and agents of this department in and near the territory of Florida as the bearer Dr. Perrine may present this paper *to*, are hereby requested to extend to that gentleman *all the aid and facilities* that may be in their power, and that will not interfere with the interests of the public service, towards the accomplishment of the objects he has in view, and which he will make known to them. J. R. POINSETT.

War Department, July 13th, 1838.

To Col. Harney, U. S. A. at Cape Florida.

Indian Key, T. F. 3rd May, 1839.

SIR—I have the honor to send you a copy of a circular from the Hon. Secretary of War with the simple request for the negative aid that you will *not permit any person* to extract any valuable plants from the vicinity of Cape Florida, without a written order from the undoubted owner of said plants; especially any near the lighthouse, or at the improvements of John Dubose, near the falls of the Miami river, or at the improvements of his sons Elias or John, on the bay.

Very respectfully,
Your obedient servant,
HENRY PERRINE,
Superintendent of the T. P. C.

To the Editor of the Farmers' Register.

I respectfully transmit to you the copies of the special letter and general circular of instructions, of the Hon. Secretary of War, and the copy of the only written request, ever made under the general circular, to Col. Harney, of the United States Army, at Cape Florida. Under these conditional instructions I have barely entertained only two humble hopes. 1st. To remove a few plants from a few spots in the destructive possession of red-men. 2. To preserve the same plants in the same spots from the destructive power of white men. The date of my letter to Col. H. shows the end of my *first* hope, and the *beginning* of my *last* hope. Up to the present date those kind instructions have resulted in *nothing*. These brief facts are submitted to the spontaneous comments of all intelligent readers over forty years of age, who have had much experimental knowledge of the subordinate workings of governmental machinery in distant deserts. Such readers will also readily conceive the sad details which prove the utter impossibility of effecting any agricultural improvement in south Florida by the fettered exertions of private individuals, or by the combined funds of chartered companies, so long as even the armies of the United States cannot afford any protection to the persons or pursuits of agriculturists on the mainland by repulsion of the savage Seminoles from the southern coast; and so long as the government of the United States does not remove its own governmental obstacles to individual industry by opening ports of entry near the southern extremities of the peninsula. And such readers will moreover duly reflect on the important fact that ever since the creation of our government, we have never had, in any cabinet, a single member, who, by a long residence in tropical regions, could have become thoroughly qualified to appreciate properly the great national importance of the speedy domestication of tropical plants in southern Florida, with the single exception of the actual, enlightened Secretary of War.

Very respectfully,
Your obedient servant,
HENRY PERRINE.

Indian Key, T. F., 22nd Oct., 1839.

THE PECULIAR CALCAREOUS SOIL OF SOUTHERN FLORIDA, AND ITS EFFECTS ON HEALTH.

To the Editor of the Farmers' Register.

Indian Key, T. F. Oct. 19, 1839.

DEAR SIR—By the paragraph appended to the meteorological abstract, you will perceive how greatly I am indebted to you for the important explanation of the admirable fact of the extreme healthiness of the *exclusively calcareous soil* of Tropical Florida. Shortly after the reception in May last, of your unrivalled 'Essay on Calcareous Manures,' I informed you that the first perusal of that invaluable work had opened to me a new world of observation and inquiry. I had never previously reflected on the importance of the extraordinary fact, that nearly all South Florida composes one vast bed of the most celebrated mineral manure of the northern and southern states of the union. I had never duly reflected on all the bearings of the important fact that all the calcareous earth of South Florida is the great manuring earth of the whole civilized agricultural world; and hence, I could not completely appreciate your high estimates of the immense value of carbonate of lime, to improve the exhausted soils of the old southern states. But, I can now readily concur in the positions repeated by you, at page 511, of your August No., in your remarks on the Agricultural Convention of South Carolina—that the judicious addition of a little calcareous earth to their present unproductive soils would increase their productive powers, many-fold in a few years. I perceive that, in Massachusetts, Professor Hitchcock has discovered and asserted, "1st, the grand desideratum in our soils, is calcareous matter, that is, carbonate of lime; 2nd, without lime in some form, land will not produce any valuable vegetation; 3rd, that the failure of a whole crop may result from the deficiency of one per cent. of some form of lime in one hundred parts of soil." Although silex and alumina are the great constituents of this terrestrial globe—although lime does not constitute more than one-eighth or one-tenth part of even the crust of this globe—although silicious and aluminous earths principally compose the visible earths of its surface—yet, as you have well shown, the smallest proportion of calcareous earth will form the most important constituent of every agricultural soil. While silex and alumina may be denominated in common, the simple, elementary, mechanical earths—while silex alone may be called the separative, loosening, uncohering, unabsorbing earth—and while alumina alone may be distinguished by the epithets of the adhering, compacting, absorbing earth—and while, hence we attribute the agricultural properties of these two elementary earths, to their mechanical properties above—we are obliged to superadd many distinctive epithets to designate the many important properties of calcareous earth—we must call the carbonate of lime, a compound elementary earth, a chemico-mechanical earth—a medico-alimentary earth—because the sandy and clayey earths are improved with the calcareous earth, by the combination of mechanical, chemical, medical and alimentary properties in the same natural form of carbonate of lime. Hence, (Q. E. D.) the slandered, arid, rocky, sandy keys of Tropical Florida, are entirely composed of the most valuable agricultural earth of the world. But I did not take up my pen to show either by theory, or by fact, the vegetable productiveness of these arid calcareous soils. In your own Register, for October 1835, at p. 335-6, your own pen has shown "the fertility produced on them by irrigation," and that hence, boring for fresh water, is the only desideratum for the vegecultural prosperity of these arid calcareous islands. But, my great object is to sustain the irrefutable healthiness of the arid calcareous soils of all Tropical Florida. My great object is to show that this irrefutable fact of the great healthiness of the soil was long since satisfactorily explained by your chapter 19th, on the properties of calcareous earth to preserve the purity of the air, and the health of mankind.

The only intelligent observers who have made any reports concerning South Florida, all concur in the facts that the whole subsoil of South Florida is a soft calcareous rock, that the whole surface of the Florida keys is composed of exclusively calcareous materials; that, in short, whether the substances are called coral or limestone rocks, shell, or coral sands, blue, or white marls, they are all solely carbonate of lime. I now add the momentous fact, that the only scanty substance, here called soil, is barely fine calcareous powder, colored by a little vegetable mould; and I superadd the inevitable result, that this scanty soil must necessarily be entirely destroyed by a few years exposure; because the mould is decomposed by the sun, and the powder is dispersed by the wind. Indeed, a moment's reflection will convince you that we cannot here ever have any noxious excess of vegetable remains, either by their increase from natural deposition, or by their accumulation from watery transportation. Suffice these facts to demonstrate to you that the soil of South Florida must be the healthiest soil of the union.

Very respectfully,
Your ob't. serv't.
HENRY PERRINE.

P. S.—Suggestions for the consideration of the editor of the Farmers' Register. 1st, republication of the letters of Gen. H. A. S. Dearborne to the Hon. Levi Lincoln, and to Dr. H. Perrine, concerning the introduction of tropical plants into South Florida, which are published in the Journal of the American Institute of the city of New York, in the numbers of the last summer (1838); 2nd, republication of the able article on the introduction and culture of the tea plant, probably written by Doctor Dekay, after his visit to the tea plantation, near Rio Janeiro in Brazil, and published in the New York Farmer for 1828, at pages 105, 106 and 107; 3rd, condensed publication of all the striking facts developed and published by you, on the properties and uses of carbonate of lime; 4th, an equally interesting abridgement of all that has been known and shown by you, relative to the importance of irrigation. It strikes me that the Southern Agricultural Convention should appoint a special committee to consider and report on the advantages and expediency of improving all their poorest soils by *calcarbonating* them; and for that purpose the committee cannot find any text book as valuable as your comprehensive 'Essay on Calcareous Manures,' which, by the by, I consult every week. Next in importance, for improving their poorest soils, it seems to me, would be the appointment of another special committee, to report on the advantages of irrigation in all the old southern states; and for this subject too, I presume the committee will find the amplest materials in the back numbers of your Register.

H. P.

THE ALMOST PURELY CALCAREOUS SOIL OF TROPICAL FLORIDA.

We received from Dr. Perrine a specimen of the calcareous earth which forms all the "keys" or islets of the Florida reef, and which also, barely colored with vegetable or other organic matter, constitutes the entire surface soil of these islets, and, principally of the neighboring main-land. The specimen sent is from the flats surrounding Indian Key, which are left naked at low tide. several hundred yards in width. The whole bottom of that part of the Mexican sea, is doubtless composed of the same earth, as well as the now higher and dry lands, which has been raised by some ancient convulsion or operation of nature, from its former position at the bottom of the sea. This calcareous earth is not (as we had supposed) the coral rock formed by the construction of insects; or, if so produced originally, it has been broken down and pulverized by natural causes, and the parts again consolidated into a very soft rock, softer than English chalk, to which in whiteness and in purity it nearly approaches. The mass contains many small shells, showing that they had been enveloped in a soft and semi-fluid earthy deposite, while under water. The specimen contained 92 per cent. of carbonate of lime. The small remainder was of fine dark-colored clay, containing little if any silicious earth.

Another specimen of the soil, (or sub-soil, perhaps,) of the main-land near the southern extremity of the peninsula of Florida (nearest to Indian Key,) received from the same source, contained 81 per cent. of carbonate of lime.

Thus it appears that the entire body of soil (if soil it can be called) of this extensive and very remarkable region is composed almost exclusively of the very substance which is almost universally and entirely deficient throughout the lands of all the great Atlantic slope, from the St. Lawrence to the Savannah. And, if not understood and remedied, the superabundance of calcareous earth in the one case, is as sure to cause and maintain sterility, as its total absence does in the other. The most barren earth of each of these great regions would be the best of manures for the other: and hereafter vessels will be profitably employed in thus exchanging these earths, which though worse than worthless in their native position, become rich manures, and the *producers of permanent fertility* by merely exchanging places.

Dr. Perrine is correct in his supposition that after a short course of tillage, the present small productive power of these excessively calcareous soils will be destroyed and lost; and then they will probably remain for ever after barren, naked, and uninhabitable "sand banks," which designation is already applied by unobservant or ignorant voyagers to some of these islets which scarcely have a grain of sand in their composition. Knowledge of the subject of calcareous manures and earth would be scarcely less important for this peculiarly calcareous region (and also the southern prairie lands in general,) where the abundance of this earth is the greatest evil in the soil, than in the other great region where it is altogether wanting, and to obtain it, is the great desideratum for the defective soils.

The suggestion made in the foregoing communication of the need of a "condensed publication of all the striking facts developed and published on the use of carbonate of lime," has before been under consideration. The object will hereafter be best reached by another and much extended edition of the 'Essay on Calcareous Manures,' in which will be embraced all the interesting and valuable facts which have been observed or established since the publication of the last edition.

—Ed. F. R.

GEARY'S PATENT COAL.

From the Mechanics' Magazine.

The formation of an artificial fuel has for some time past occupied no small portion of the attention of scientific minds. The high price of the natural mineral—the great space it requires for stowage—the quantity of its refuse and the nuisance of its smoke, were amongst the disadvantages which it was sought to be overcome by some artificial combination of combustible matters. We have from time to time published accounts of the various patented methods of manufacturing artificial fuel and coal, and of various experimental usings thereof for steam engines and other purposes, to which we have now to add, the particulars relating to another composition invented by Mr. Stephen Geary the architect.

Mr. Geary's artificial coal consists of a mixture of the following ingredients:—First, about half of small coal, or coal-dust; second, pitch, or bituminous matter obtained from coal, or other mineral or vegetable tar; third, coal or coke cinders, powdered peat, or bark of trees, sawdust or tan; fourth, powered clay, freestone, chalk, plaster, earth, sand, or other earthy matters; and lastly, about a fortieth-part of some acid—sulphuric acid, as the cheapest, is that which is used by Mr. Geary.

The coal is manufactured in the following manner:—The pitch is to be melted in a pot, and the cinders gradually introduced—stirring constantly. The powdered clay is next to be added gradually, then one-half of the small coal; as soon as these matters are well amalgamated—being kept at a good heat during the operation—the acid is to be poured in, and well stirred through. An effervescence will in a short time take place, producing a froth on the surface of the mixture; and as soon as this appears, add the remainder of the small coal. The mixture of the ingredients having been completed, the fluid mass must be kept in a state of agitation by stirring until the whole is well and equally heated. The mixture may then be run into moulds of any desired shape. When the mixture has become partially cool, pressure or beating may be applied in order to compress the blocks of fuel into as small a compass as possible. The pressure or beating is not essential, except in cases where the coal is intended to be used as steam-boat fuel, where stowage room is valuable.

The ingredient in this composition, which is new, and from the action of which on the other component parts, the beneficial qualities of Mr. Geary's fuel result, is the *acid*; and he claims this addition of an acid or acids to the other matters which have all been used before, as constituting his patent.

Some specimens of coal thus manufactured were submitted to Professor Brande for his examination and opinion, who reported as follows:—

"That it burns well, kindles readily, and has most of the characters of some of the bituminous coals. It undergoes combustion rather more rapidly than the ordinary Newcastle coal, but appears to give out as much heat and to form a brisk, agreeable, and efficient fire, and I apprehend no objection to it on the score of smell, dust, smoke, soot or ashes, and it is entirely free from any quality prejudicial to health.

"I have no doubt that it might be available in the manufacture of gas and coke, but whether economically or not is a question which I have no means of determining.

"Accurately to ascertain the relative value of this fuel, as compared with the ordinary varieties of coal, would require a series of experiments upon a larger scale than I have been enabled to undertake, but from the trials which I have made of it, it appears to me to compete with the superior kinds of coal, and if so, the greater number of its applications to inferior purposes are matters of comparatively little moment."

Mr. Squire (chemist in ordinary to her Majesty) also reports very favorably of its merits in the following terms:—

"I have examined the properties of the patent coal, which you placed in my hands for that purpose, and have to report that it makes a cheerful fire in the open grate, the temperature of the room being more steadily increased, and the maximum of heat longer retained by it than with common coal, and although it does not throw out so violent a heat as the best screened coals, yet it has the advantage, if left alone, of continuing to burn till all is consumed to ashes, leaving no cinders; it is entirely free from any unpleasant smell, and when burnt in close vessels it yields nearly the same quantity of coke as the best coals do, and the gas given off burns with great brilliancy."

These favorable opinions, we are happy to be able to say, have been confirmed by subsequent experience. The Commercial Steam-boat Company, in consequence of the beneficial result of some experiments they made, have adopted it for the use of their vessels. One experiment was in working the engines of the *Prince George* steam-boat from London-bridge to Chatham, Sheerness, and Southend. The same weight of Mr. Geary's coal was taken on board that was usually consumed in a trip to Chatham of common coal, and there was found to be sufficient to work the engines as far as Gravesend on the return voyage. Another trial was in the *Duchess of Kent* steamer. The quantity of common coal usually burnt by this vessel in a voyage to Ramsgate is *five tons*; she performed the voyage with *three tons and a half* of Mr. Geary's Patent Coal. The price paid for the common coal by the Commercial Company was twenty-three shillings per ton. The cost of the patent coal is eighteen shillings per ton. From this there appears an enormous saving in cost, in stowage room and in weight.

There are other advantages besides these which it is important to mention: the captains and engineers of the boats state that there are hardly any ashes left after combustion; no clinkers; only a light white vapoury smoke; and that the labor of stoking is much reduced.

We also understand that coke manufactured from the article has been used with great success on some of the railways, particularly the eastern counties.

An extensive manufactory has been erected for the production of this patent fuel, in the neighborhood of Bow, and another is in preparation at Gravesend. Judging from the foregoing statements, we may venture to predict an extensive demand for this new article of commerce.

PROCEEDINGS OF THE NORTH ANNA AGRICULTURAL ASSOCIATION.

To the Editor of the Farmers' Register.

By a resolution of the North Anna Agricultural Association I have been requested to forward for publication the inclosed communication on the cultivation of the beet and mangold-wurtzel.

I also send the following resolutions of the association on the lamented death of Judge Buel, late editor of the 'Cultivator.'

"Resolved, that the public-spirited, able, and successful exertions of Judge Buel, late editor of the 'Cultivator,' to improve the agriculture of the country, have merited the highest praise, and entitled him to the gratitude of every friend of agriculture, and that this association deplores his death as a public loss.

Resolved, as a testimonial of the estimation in which we held him, and of our regret for his loss, that these resolutions be transmitted to the 'Cultivator' and the Farmers' Register, for publication."

W. HOLLADAY, *Secretary*.

On beet culture.

Communicated to the North Anna Association for the attainment of knowledge on agricultural subjects.

The cultivation of roots for feeding stock is beginning to attract that attention which it so justly merits; and in furtherance of the objects of our association, I will communicate the result of an experiment which I made the last season in raising the mangold-wurtzel or scarcity root, and the Silesian or sugar beet.

The piece of ground on which the experiment was made consisted of about one and one-third acres of land, which had been ploughed the preceding fall with a two-horse plough, as a preparation for Indian corn. The soil was of good quality, part of it a sandy loam, part clayey. About the 20th of April a light dressing of well rotted manure was scattered over the thinner parts of it; after which it was well ploughed with a two-horse plough; a coulter (also drawn by two horses as deep as it could be forced into the earth) following in each furrow immediately after the plough, so as to break and open the subsoil. An iron-toothed rake drawn by two horses, followed till the soil was well pulverized, and in fine tilth. Small lists or ridges were formed at intervals of about two and a half feet, by throwing together two furrows of a one-horse plough, over which a hand rake was drawn, to smooth them and throw off the clods; these lists were opened (with a pointed stick drawn along there by the hand, somewhat like a rake handle reversed) to the depth of about one and a half inches, the seed dropped into them from the hand, at intervals of four to six inches, one seed in a place, and covered shallow with fine earth. The seeds were prepared for planting by steeping them twelve hours in warm water saturated with salt-petre, and then rolling them in plaster-of-Paris. The weather was dry and windy for several weeks after planting, and about half the seed failed to vegetate; they vegetated best where the soil was moist and clayey. As soon as the plants attained sufficient size, they were thinned by hand so as to stand at from eight to twelve inches apart in the drills, those pulled up being transplanted to the vacant spaces; owing to the drought, but few of these lived, and the few that lived did not thrive or grow well. From the planting and transplanting together, about two-thirds of an acre stood, of which rather more than half was sugar-beet, the rest mangold-wurtzel. The crop was worked once with the hand-hoe while the plants were very small, (the weeds and grass being carefully pulled away at the same time by the hand from immediately around the young beets,) and twice afterwards with the single plough (a wing-coulter,) and the hand-hoe. Here, as in the greater part of Virginia, the season was one of unusual drought, corn yielding generally not more than from three-fifths to two-thirds of an average crop; and during the summer I thought my crop of roots would be a total failure; but as the fall approached, it became more seasonable, and then the crop improved rapidly. On the 23rd October, I took them up to seed the land in wheat, and to my surprise harvested more than five hundred bushels of fine roots, besides four or five ox-cart loads of tops, on which my hogs fed kindly. The crop succeeded best where the soil was clayey and moist; and I have found the roots excellent feed for both cattle and hogs. The opinion has been frequently advanced that the climate of Virginia is unsuited to root-crops, being too subject to droughts; but my experience of the past season assures me that to raise the beet and mangold-wurtzel, a fair trial is all that is needed. My roots were worth more than any grain crop I could have raised on the land; and though the relative product of the two kinds cultivated was not accurately ascerained, I think the difference inconsiderable; while the beet is much heavier in proportion to its bulk than the mangold, and probably contains more saccharine matter, it is also more easily preserved through the winter; and on the whole I incline to give it the preference.

A good drill-barrow would have saved me much labor in planting; and if the seed had been steeped longer they would have vegetated better. A friend, on whom I entirely rely, informed me that he steeped a few seed, and kept them moist in a bag covered with earth till they sprouted before planting, and scarely one of them failed to grow well. If this communication shall encourage others to try the root culture, it will not have been made in vain.

JOHN Y. HOLLADAY.

THE MARL BEDS NEAR NEWBERN.

To the Editor of the Farmers' Register.

Newbern, N. C. Aug. 30th, 1839.

DEAR SIR—Accompanying this letter, I have transmitted to you three specimens of marl, or calcareous matter, found on my farm on Neuse River, about twenty-two miles up the same, from this place. The specimen marked, No. 1, is very abundant, and seems to run in veins through that portion of my field nearest the river. I tapped a vein of it on the side of a hill which terminated very abruptly in a meadow, and pursuing the same, found that it run through a large field at various depths; and in several places it appeared above the soil, in the field. This section of Craven county, bordering on the Neuse River, is inclined to be of a limestone formation, and in many places, both on the banks of the river, and in the interior, there are large masses of the rotten limestone to be found, which as yet have never been applied to any useful purpose. As you ascend the river, its banks disclose different formations of limestone; there are fine specimens in some places of what is termed the shell rock, from which "hand-mill stones" are manufactured, and are extensively used in the country to grind corn into meal, and hominy. There are, also, good specimens of the more solid rock, with now and then very extensive formations of the shell marl, such as the specimen No. 1, and combinations of the oyster shells with other calcareous matter. The other specimens, No. 2 and 3, are found in extensive formations on my farm, but are more or less combined with a hard limestone rock, which make them more difficult of access, and require more labor to dig them from the soil or earth. With all the advantages which the Neuse River presents, of its extensive beds of marl, I believe that not one of our planters have as yet derived any benefit from them, or applied the marl to their lands with any good practical benefit; this has arisen not so much from a want of knowledge of its good effects, but in a great measure from our ignorance in its application, and also from fear that we might rather produce an injury than a good to our lands. There are portions of our lands in the vicinity of these limestone formations, constituting a sort of ridge, running parallel with the river, which are strongly impregnated with lime, as is obvious by the rocks peering above the ground in some places in the fields, and the effect produced by the same, both upon the feet of the laborers and horses. Back of these lands, there are *oak and pine lands*, in which there does not appear to be any lime, nor are any of the effects of it discovered. These lands afford a large supply of both vegetable matter and swamp and marsh mud, which also contains a large quantity of vegetable matter. I will however, reserve a more particular description of the limestone formations of the Neuse, &c., and the character of our lands, for a future letter, and proceed to trespass upon the ready willingness which you have always evinced to afford the desired information, to your many querists. I should be glad to know what per cent. of lime the various specimens of marl which I have sent you will afford, and which you consider best to be apapplied to such lands as I have described above. I forgot also to mention that the low grounds of the Neuse are overflowed every year, and on the subsidence of the waters, there is left a rich alluvion, which, combined with the leaves which have fallen for successive years, forms an undecayed combination of mud and leaves, that I have thought might be made a very rich manure, with the action of lime upon it. Will a combination of either of the specimens of marl which I have sent you with this undecayed matter, make a valuable manure for our lands? If so, in what way and in what proportions should it be prepared? How would our swamp mud mixed with either of the specimens of marl answer for manure, and what would be its probable effects on our lands the first year, and how should that be prepared? Can we convert our extensive beds of rotten limestone to any good practical agricultural purposes? In fine, I do not consider that there is any merit in saying to you that I have no practical knowledge in relation to the use and application of marl, and that I am a novice and sciolist in agricultural matters, and as "misery is said to love company," I find that my neighbors are all in the same predicament, and that I can derive no information from them on the subject—this must be my apology for trespassing on your valuable time, and likewise for seeking answers to queries which I have no doubt you will deem very trite and common, and rather *schoolboyish*, for a farmer. Would the application of either of the specimens of marl sent, to such lands as I have described, unaided by any other matter, be productive of much benefit? As a large district of country is interested in obtaining information in relation to the marl I send you, your views in general in relation to it, would be very acceptable indeed.

Very respectfully yours,
JAMES W. BRYAN.

The three specimens of marl which accompanied the above letter, have been carefully analyzed, so far as it regarded their calcareous ingredient, or proportion of carbonate of lime.

No. 1, consisting principally of loose small shells, and fragments of shells, yielding 66 per cent. of carbonate of lime.

No. 2, apparently of firm texture, or hard marl—62 per cent.

No. 3, still harder—75 per cent.

As the best mode of answering the other in-soil, but assuredly after, its greatest use is as a stimulant or solvent of the vegetable or animal manures within the soil, and for whatever of pabulum may be requisite to the fibre or rigidity of the plant in sustaining itself against the influence of the winds while attaining its maturity. We have a familiar exemplification of the action of lime on dried vegetable substances, on boards and pickets. The minute splinters left in boards by the teeth of the saw, if soggy or prone to rotting, *whitewashed,* become hard and indurated, and seem checked in their progress to decay by the lime, and the wood is perfectly solid. The same result will be visible if it be applied while yet caustic to dried hay or straw. When lime is brought immediately in contact with animal substances, as with oils, it corrodes and solidifies them; with animal juices, it assails and operates similarly on them, leaving nothing but the mere aqueous fluid; with animal flesh, it checks its putrefactive progress, and as it were petrifies it; with effluvia, it absorbs it. The chemists say, probably with truth, what the lime takes up, or renders *insoluble*, in time it will give back again. This, though true as to a *part* of the substance imbibed, may or *may not* be as to *much of it*; but if even so, it should be recollected that the object of applying manure is to benefit the first, as well as the future crops; and the first is dependent entirely, whatever may be the supply put into the soil, upon that portion of the manure which is immediately soluble; and if that be held in suspense by the lime, the first crop at least will suffer. This not unfrequently happens with the farmer as to his manure. For the want of an admixture of a portion which is readily soluble, his crops come up ahead of the manure, and leave him to suppose it not so effectual as he had anticipated; an argument, by the by, for blending manure with the soil before its moisture is assailed and evaporated by the drying influence of the sun, and for that humectation which could be given to it, from a reservoir in or about the barn-yard for the liquids, and an admixture of it at the moment of taking it out for use. But I am digressing. To return: as to sea-weeds—

I would then *first*, use them green, as far as my farming wants might require or permit.

Next, if the supply be sufficiently extensive, (with me it probably is 800 two-ox cart loads annually,) I would use it liberally as litter in every and any shape about my stables, cattle stalls, hog pens, barn-yards and muck roads; and that too in opposition to common practice, as far as practicable, while green; because, it will be perceived by those who use it, that as (with the wrack grass more visibly) the weeds dry, a white efflorescence of salt gathers upon the surface, which rains wash away, and this salt is one of its most valuable properties. If, while passing from its green state, its succulent, mucilaginous and saline properties escape into the materials for manuring, which environ it, the vegetable remains of the weed, divested of its natural juices, will, in escaping, serve as an absorbent of other useful liquids brought in contact with it.

A *third*, and very beneficial mode of using sea-weed, is by incineration. Reduced to ashes, its properties become concentrated, and it is both powerful as a manure and useful commercially. The carbonate of soda of commerce is obtained by lixiviating the ashes of sea-weed. The best variety is known by the name of *barilla*; an inferior kind, known by the name of *kelp*, is prepared from sea-weeds on the northern shores of Scotland, and may be so any where it is to be found. The purest barilla always contains potassa and soda, and the chlorides of potassium and sodium; each of which, though perhaps most profitably employed in the manufacture of soap and glass, would if applied as a manure to the soil, operate powerfully, and at the same time, from its strong alkaline influence, serve as a solvent to other manuring substances in the soil.

I believe the sea-weed, though best in this point of view if ploughed in green, even in its dry state, a corrective of the acidity of a soil. On a field, the soil of which was probably the poorest of my farm, and in which I was preparing to put rye, my carts had deposited some green sea-weed in heaps, with the intention of spreading it before ploughing. A want of time prevented the execution of this purpose in the way proposed, and it was thinned with a fork around the small heaps as it lay, after it had become dry, and ploughed in with the manure for the field. As the crop grew, the grain rose in its growth most visibly within the circumference of the sea-weed thus spread around the heaps, and so much so as to be remarked by all about the farm, and to leave no doubt of its influence. The next year, as the grass came in succeeding the rye, some sorrel was seen generally over the field, but none was visible within the circumference of the sea-weed; and the grass, in comparison with the rest of the field, was visibly improved, and yet continues so. The sea-weed used on this occasion was of the species familiarly known by the name of *chowder*; a very thin leaf, very aqueous, and prone to rapid decay.

The principal kinds in use as a manuring material on my shore, and generally in this vicinity, are the *zostera marina* above alluded to, (sometimes called, here and in England, wrack grass;) the chowder also before named, and rock weed. There is also occasionally intermixed a dark brown, broad, long and gelatinous leaf, the name of which I do not know.

Sea-weed, particularly the latter and rock weed, are eaten with avidity by swine; and where continual access is had by them to it, will promote their growth and fatten them, though the flesh is far from palatable, if they are not fatted, for two or three months before killing, exclusively on other food better fitted for putting good flesh on them. Some farmers give them little else, up to within that period of fatting time. When thus permitted, however, to range for food on the sea-shore, they feed exclusively on muscles and such shell-fish as they can crush with their teeth, are fond of fish generally, and particularly so of the description known as *horsefeet*.

The wrack-grass sea-weed may also be used as a thatch, and forms a more durable defence against the violent winds and heavy rains than straw.

The latter also is used as a substitute for horse-hair in stuffing mattresses and furniture. For this purpose, it is carefully washed twice in fresh water, and then dried quickly, the intermixture of other sea grasses less fitted for the purpose being picked out.

It is very convenient and effectual for sheltering a manure heap from the drenching of rains, and protecting it from solar heat; for covering plants in gardens, vegetables left in garden grounds, or buried for winter keeping; or for young trees, to protect them from the rigorous frosts of the wintry season, and for a variety of purposes about farming buildings.

An opinion of the practical estimate of its utility may be formed from the fact, that for manuring purposes, it is carted in Ireland to the distance of forty-five miles inland from the sea-coast.

Ezra L'Hommedieu, Esq. formerly senator from Suffolk, a very intelligent and skilful agriculturist of his day, in a communication made to the Agricultural Society of this State in 1791, says, "many farmers are of opinion that one load of sea-weed as a manure, is equal to a load of cow-yard manure, for raising wheat." And he says, "that within the two years then preceding, he had used more than 200 loads for wheat only, but he did not find it equal by five loads in thirty; that it was found in some respects superior to any other kind for Indian corn, as it prevents worms and injury from drought; that the preceding summer, much Indian corn had been cut off by that means, but where the lands were manured by this weed, the corn was not affected."

It may not be amiss here, while quoting from this writer, whose authority is too well remembered to permit a question as to the authenticity of his statements, to notice what he says of the manure of mud taken from salt water creeks and swamps, and in which the weed often grows:—

"Mud from the creeks on Long Island and on the sea-coast of some parts of Connecticut, has been made use of as a manure, with success in some instances, when in others no benefit was experienced. This is owing to their using two kinds of mud. In order to determine which is fit for manure, if you run a paddle or a pole into the mud, and it sticks so fast that it is with some difficulty you pull it out, you may determine that mud unfit for manure, it being only loam or clay soaked with water; but if your paddle or pole is drawn out easily, the mud is fit for manure. This mud being taken out in the summer and exposed to the frost during winter, in the spring, becomes as fine as leached ashes, and is a good manure especially for grass; being spread on poor loamy land, it brings up white clover similar to ashes, though it takes a larger quantity."

To return particularly to sea-weed, and to direct attention to facts, which here have been little if at all noticed. There are many of the *Fuci* class of sea-weed which elsewhere are, and here may become edible. They are used as condiments by families living near the sea-coast in other countries, and by the poor, because in seasons of scarcity they furnish articles of resource as a food.

There are numerous species employed in gardening as manures.

The *laminaria saccharina* (sweet fucus or sea-beet) is sometimes boiled by the common people of England as a pot herb. The Icelanders, Audubon says, boil it in milk to the consistence of pottage, and eat it with a spoon. They are also said to soak it in fresh water, dry it in the sun, and then lay it up in wooden vessels. It soon becomes covered with a white efflorescence of salt, which has a sweetish taste, and in this state they eat it with butter. They also feed their cattle with this species.

The great value of the Iceland and of the Carrigan moss or *lichen*, in consumptive or pulmonary complaints, is well known every where.

The transparent edible nests of the East-India swallow, so much in repute at the luxurious tables of the rich in China and the East, are now generally believed to be almost entirely composed of gelatinous fuci, and more especially of the lichenoides. The plant also is in high estimation for the table in India.

Of the *halymenia palmata* (L. dulse,) both the tender stalks and young fronds are eaten fresh from the sea, commonly without any preparation. They are sometimes considered as forming a salad, but more generally are used as a whet. It is said that the inhabitants of the Greek Islands are fond of this species, adding it to regouts and olios, to which it communicates a red color, and at the same time imparts some of its rich and gelatinous qualities. The dried leaves infused in water exhale an odor somewhat resembling that of sweet violets, and they communicate that flavor to vegetables with which they are mixed. Lightfoot mentions that in the Isle of Skye in Scotland, it is sometimes used in fevers to promote perspiration, being boiled in water with a little butter. It is soft and limber, and does not become rigid in drying, being of a more loose texture than many other sea-weeds.

The *halymenia edulis* (red dulse) is by many preferred to the *h. palmata*, especially for cooking in the frying pan. Like that species, its smell somewhat resembles sweet violets.

Laminaria esculenta (badderlocks or henware). The midrib, stripped of its membrane, is the part chiefly eaten. In Orkney, the pinnæ are also eaten under the name of *pickles*.

Sphærococcus ciliatus (ciliated dulse,) and *Laminaria digitata* (fingered dulse, sea girdle and hangers,) are sometimes gathered and eaten, like the *halymenia edulis, palmata*, and other species.

Laminaria digitata. In Scotland, the stem of this species is used for making handles to pruning knives. A pretty thick stem is selected, and cut into pieces about four inches long. Into these, while fresh, the blades are stuck; and as the stem dries, it contracts and hardens, closely and firmly embracing the hilt of the blade. When these handles have become hard and shrivelled, and have been tipped with metal, they are hardly to be distinguished from hart's horn.

Chondria pinnatifida (pepper dulse,) in Scotland, is eaten along with the *Halymenia palmata*; and in Iceland, it is used instead of spice. This species is common to Scotland, Iceland, the Red Sea, and the shores of Egypt.

Floating fucus. The succulent fronds, Turner mentions, are selected and pickled like samphire; and the young shoots are eaten as a salad, seasoned with juice of lemons, pepper and vinegar.

Ulva lactuca (lettuce leaves or oyster green). The thin green pellucid membranes, of which this vegetable is composed, are eaten raw as a salad, and esteemed a great delicacy by such as are accustomed to the use of marine vegetables.

Thus, sir, in answer to your wishes, I have given you what I know, or have read of sea-weeds, and their various uses and applications. It may serve to show us that the vegetable kingdom of the ocean, if not as extensive as that of the dry land, has at least its treasures, not only to fertilize the earth, to minister to the weak and the infirm, to feed the poor and the needy, but even to gratify and to satiate the ever-craving and the pampered appetites of the sensualist; that as yet we have not learned fully or perhaps fairly to appreciate them, or this among the many bounties of an ever-good and an all-wise Providence.

Yours truly,
W. A. SEELY.

From the Journal of Commerce.

MILK.

[*From a correspondent in Europe*]

It is gratifying to see, from the columns of your paper, that deep interest has been awakened in regard to the quality of milk used in the city. It would seem as if no parent who reflects that the bones and muscles and constitutions of his children are composed from this very milk, could hesitate to incur any expense, to make any efforts which his circumstances permit, to ensure a supply of the very *best* material for his purpose. Even the most rigid economy requires it whether we think of the expense of a feeble family, or of the continued demands which they often make upon parents, even after they are sent forth into the world. I cannot but hope that this feeling will even aid in the promotion of the northern rail-roads, from which it is most truly observed the most effectual relief can be afforded. It may be said, indeed, that pure milk can be procured from the farms which abound in every direction from New York. But let it be remembered it must be transported for several hours in conveyances which would serve admirably for *locomotive churns*—which cannot fail to prepare the milk to become speedily sour, whatever may be its original quality, unless indeed it may have been previously diluted and whitened with lime water.—On a rail-road, it may be brought six times the distance in the same period, and almost without perceptible motion; to say nothing of the greater security of good food in places where grass is cheaper than slops, or even the mixture of decayed vegetables and parings and remnants of salad, &c. which form the refuse of the kitchen, and which are so often procured as a dainty morsel for the cow, to be returned afterwards in the form of pure milk!

I have recently met with a report addressed to the Medical Society of Paris, on the subject of milk, which shows the importance of procuring this food of children from the purest source, in a new light; and proves that "distillery slops" are not the only thing injurious to its quality. Messrs. Petit and D'Arcet, distinguished chemists in Paris, were led to examine minutely the quality of different specimens of milk, from observing their very different effects upon children. Some that they examined, and which they found to be speedily thrown up by the children in coagulated masses, was proved by chemical tests to have a predominance of acidity, though it was not perceptible to the taste. Other portions which were well digested, were proved to have a predominance of alkali, which is considered the natural condition of milk. On inquiry, it was found that the cows from which the first milk was obtained, were *fed in the stable*, with remnants of vegetables as well as hay, and almost without movement—that the alkaline and healthy milk was from cows allowed to *range and feed in the meadows*.

These observations led them to examine the varying qualities of milk on a more extensive scale, as to the simple fact of the predominance of acid or alkali, and for this purpose they availed themselves of a test which may be procured without difficulty from a chemist. It is paper dipped in a solution of *litmus*. If it be of good quality, the blue color will be changed to red by a fluid which is acid. A tincture of the blue cabbage will detect acidity also, if it is sufficiently fresh, in the same way.

During a voyage through Flanders, M. D'Arcet in company with the celebrated chemist Gay Lussac, visited some of the best dairies, in which the cows are fed upon the meadows, and found the milk *without exception*, to contain a predominance of alkali. They examined the milk of cows fed in the stall on turnips, the leaves of vegetables, &c. which were only allowed to pass two hours a day in the meadows, and found it as uniformly acid.

The same experiment was repeated in the grazing regions in the north of France, and uniformly with the same results.

It would seem then to be fully ascertained, that pure and perfect milk can only be given by cows that pass the greater part of the day in the meadows during the mild season, and that it cannot be furnished by cows which are fed upon the parings and tops of vegetables or other food than the grasses, and are deprived of exercise,—to say nothing of the pernicious effects of the distillery slops or the sour and putrid remnants of the kitchen. And yet this milk must be the staff of life of childhood—the staff of which its bones and sinews are formed; and its quality will do much in determining the feebleness or vigor of the next generation in your city. It is too true that the impure and often infected air, and the limited exercise of children in a city—added to the incessant and intense excitement of its movement and bustle—while they often render childhood precocious, and youth premature, lead to decay equally premature in a generation taken together. But surely this is an additional reason for seeking the purest and best possible nourishment in order to counteract these inevitable causes of decline.

I am sure that many a mother will thank me for adding that these chemists, on observing variations equally great in the digestion of children fed by different nurses, found the same difference in the quality of their milk—and that which was thrown up frequently coagulated, was uniformly sour when it was received—not to the taste always—but as tested by litmus paper. They observe that the child is not only deprived in this manner of suitable food, but he is obliged to call for it 40 or 50 times a day, in place of 4 or 5 times, and thus fatigues and injures her own stomach, without being nourished, and wearies and exhausts his nurse so as to render the quality of the milk still worse.—Such a state of things, they say, ought immediately to be remedied, and that it can often be done by giving the mother or nurse a more simple diet, or by means of medicine, which a judicious physician can prescribe, among which they consider minute doses of super-carbonate of soda the best.

But can nothing be done to paliate the evil until we can procure pure milk? M. D'Arcet made the experiment in his own family of adding one half a grain of super-carbonate of soda to a pint of milk from a city fed cow, and succeeded in rendering it harmless at least, and far more nutritious.—

One of his children, so feeble that he despaired of being able to save him, was thus suitably nourished, and grew up to vigorous health, by observing daily the quality of the mother's and finally of the cow's milk, and taking the proper measures to correct its defects. Now it will be incomparably better to procure the pure milk of the grass fed cows on the banks of the Hudson and on the hills of Connecticut, than thus to feed the poor children with a drugged mixture; but it will be at least a temporary palliative until the northern rail-road can be completed, and pure milk can be obtained as easily as the pure water of the Croton river.

Housekeepers will be glad to know that by adding the same proportion (one half a grain only to a pint of milk,) good milk may be kept 24 or 36 hours, without danger of souring, even in warm weather. But let them beware of converting food into medicine by increasing the quantity, for I have known this "simple, *harmless* thing," as it is called, even in the shape of excessive drafts of soda water, produce sores in the mouth and lips, which indicates corresponding sores in the stomach and this was followed by the miseries of dyspepsia and decline. An able physician assures me that he could ascribe the death of a patient, from a similar state of mouth and stomach, to nothing but the famed morning cordial of Connecticut lay physicians, "*pearlash and cider.*" It is time the world had learned that medicine cannot safely be used as daily food or drink, without leading to disease.

Yours, &c. S.

GRANT THORBURN IN DEFENCE OF HIMSELF AND HIS CHINESE TREE-CORN.

We had designed our remarks in the September No. (page 573) as the last notice of this subject. But as Mr. Thorburn has written in reply, and defence, and asks that his letter may be laid before the readers of this journal, rather than permit the least ground for charge of denying justice, or of being wanting in liberality to any one whom we have assailed, we will again permit a page to be occupied with this subject. We shall give Mr. Thorburn's reply in full; and then our own comments, and *last* notice of him or his subject.

To the Editor of the Farmers' Register.

Astoria, L. T., 6th Nov., 1839.

SIR—I send you a box of the Chinese tree-corn, and two stalks having the ears on them as they grew; I think you will find that at least it is a new variety. Also about 30 ears of the corn to distribute among your friends; and I hope if you live to see the 10th of August next, you will be satisfied that I wrote nothing about this corn but the plain truth. This corn, Mr. Editor, is really a valuable article; it is a pity it should be strangled in its birth. I ask nothing for it or for myself, but a fair trial. When I commenced selling seed, 30 years ago, it was with a stock of only fifteen dollars; now, there is not a town, village, or hamlet on the continent but you will find, "*Thorburn's seeds sold here.*" It is but a fair inference then, that the seeds must have been good, else the business would not have grown so fast. Now, Mr. Editor, after having spent thirty of the best years of my life with the approbation of the public, you may think it is not a very pleasant reflection to have so many hard names (without a cause) thrown in my face; notwithstanding all that has been said both for, and against it, I am convinced from two years experience, that it is the most profitable corn for the farmer of any in the country (the *Baden* excepted, but this rarely ripens with us); most of my correspondents who have been successful in its cultivation this year, say, they will never plant any other sort. The demand for the Chinese corn continues, it is sold at my son's stores for twelve and a half cents per year. I think I have given away thousands, but never sold an ear except to my son.

George I. Pumpelly, Owego, Tioga co., N. Y., 10th October, 1839, writes, "my crop of Chinese corn is the finest I ever saw of any corn, 100 bushels to the acre," &c.

The proprietor of the 'Painsville [Ohio] Telegraph,' says, "I cultivated a small patch of Grant Thorburn's Chinese corn; average yield, four large, sound, ripe ears, for every kernel planted."

R. H. Keywood, writes to the editor of the 'Buffalo Commercial,' 22nd October, "I send you an ear of the Chinese corn raised on my farm in Ohio, which proves to be [others to the contrary] all that was recommended by Mr. Thorburn," &c.

T. M. W. of Cleveland, Ohio, 25th October, writes, "about the middle of August my whole crop of Chinese corn was ripe and gathered; it was previously examined by the officers of the County Agricultural Society, they gave it as their judgment, that it would yield, at least one hundred and twenty bushels to the acre of shelled corn; but as I left home before it was shelled, I cannot speak to a certainty." N. West, Indianapolis, Indiana, planted his Chinese corn 8th of May, was all ripe and gathered 29th August, proved to be true as represented by G. Thorburn, &c. &c. Mr. Coomlis, Freehold, New Jersey, is of the opinion, it will produce one-third more than any corn raised in his neighborhood, &c. Mr. Hendrickson of the same place, writes in the same strain of commendation. Mr. Prentiss of the same place, planted from the 16th to the 21st May the Chinese corn, was ready for husking on 1st September. Mr. R. S. D. Jones, Friendship, Md., planted a few grains in his garden after his other corn was up; and the tree-corn was fit for use the earliest, &c. I might fill a small volume with similar extracts, but enough I think has been said to induce those who have failed in the first to give it a second trial. Now, Mr. Editor, as there are two sides to this, like every other question, I think I have a claim on your impartiality to be heard in my own defence, in your widely circulating paper. Yours sincerely,

GRANT THORBURN.

The corn has been received, and will be given away to any of our subscribers who have not already had enough of this famous seed. If not so disposed of, it will be boiled in the wash for our town milch cow, as a partial indemnification for the payment of freight and cartage. As to the quality, the separate ears are of good size, (for a northern flint or hard grained corn,) just as might be *picked* of the best, from any crop, of any kind. The ears on the stalks, (three on each,) are very inferior. These *do* grow on the ends of long stems—(though such we know is not the *general* character of the growth—) and so much the worse for it; as every farmer would prefer that his ears of corn should grow on short stems, firmly attached to the stalk, rather than on long ones like these. A similar mode of growth (on long stems) may be often seen on particular stalks of other kinds than this; but the peculiarity would be one to avoid in the selection of seed, rather than to be sought for or prized as an advantage.

It is amusing to observe how cunningly the writer has made his reply to our strictures to serve as an actual though disguised *advertisement* for the sale of his corn, accompanied by recommendary puffs, like quack medicines, in the most approved form—and at the same time letting the public know that the sale is to be continued for another year, at the reduced price of 12½ cents the ear. No doubt to effect this object, and at so cheap a rate, was the main purpose of the above *reply*.

But even if every particular attempted to be made out in the above letter, were fully admitted—and supposing (what we have no right or wish to deny,) that each of the *certifyers* wrote in perfect good faith—what would it all amount to? No more than this—that out of the thousands of persons who bought the seed, and planted and cultivated it on the richest ground, and with the greatest possible care, that these few persons (and possibly hundreds of others also) made a very large increase from the seed and for the space planted. Could it have been otherwise, under like circumstances among several thousands of such plantings, with any other kind of corn, whether a good or a bad kind in general? All the numerous varieties of Indian corn (other than by cross-fecundation,) have been produced by the effort of nature to accommodate the growth to the different circumstances of soil, climate, &c., and therefore it is probable that there is no one variety, however unproductive in general, that may not be the most productive in some peculiar circumstances. Therefore, if out of several thousand persons who have in the most careful manner cultivated Mr. Thorburn's high-priced seed no more than a dozen or two have found it a *superior product* (or have guessed so, without any accurate experiment of comparative product of another kind,) it is rather to be wondered at that such results (or supposed results) have been so few, than so many as are presented.

But, if in fact it were fully proved, instead of the proof being altogether deficient, that this corn is a more productive and valuable kind than the kinds long known and usually planted, its recommendation and sale would be not the less subject to the charge of designed deception, and an imposition executed on the buyers and the public. The *true issue* is not *whether this corn is a good kind, or not*, but 1st, whether Mr. Thorburn, when he first recommended and offered it for sale, *knew* it to be such—and 2nd, whether its sale was not urged by false pretences. In our first denunciation of this humbug, (page 490, vol. vi.) when republishing Thorburn's original advertisement and statement, we took the same ground which we still maintain. When exposing all the other pretences there made, we expressly declined saying any thing against the productive value of the corn. Our words then were these: "Of the corn itself, it *may* or *may not* be a good kind. It would be as presumptuous in us, upon this [Thorburn's] statement, to pronounce it of no greater value than the ordinary kinds, *as it is in Mr. Thorburn to assume so much value for it, upon his few facts, and very slight experience of its growth.* We merely *believe* that it is of no superior value to other kinds, (except like spring wheat, as a humbug,) but do not pretend to *know* it." If then, by possibility, this should prove to be, (what not the least proof has been presented *now*, and much less a year ago,) a truly valuable and productive kind, it would be an accidental result, which Thorburn had no ground to anticipate last year, nor to promise—and which his now *two years* experience would still be insufficient to establish, even if his own declarations are to be taken as proper evidence of the facts. We therefore will not permit Mr. Thorburn to make up a new issue, upon which to try his claim to truth and integrity. The question is not, and never has been, whether a particular parcel (or different parcels) or variety of corn was a good kind to cultivate; but the following several other points were the matters in question, viz:

1. Whether the *foreign origin* of the corn was truly stated?

2. Supposing the origin to be truly stated, whether G. Thorburn knew, or had any sufficient ground for belief, that the corn he so highly recommended, and sold so high, deserved his commendation, or indeed was worth any preference?

3. Whether the giving the whole net proceeds of the sales in charity has not been even more of a deception than we anticipated and stated at first.

Now in his reply, Mr. T. merely again offers his own assertion, and the favorable opinion of a few individuals as to the matter *not at issue*, and not disputed (though certainly not believed) by us, and says not a word as to the matters which were really in dispute—but which his silence will now leave no longer questionable. He has not adduced the testimony of the merchant in New York who, as he stated, found the original seeds in a box of tea—nor has he answered a word as to the promised appropriation of all his gains to charitable purposes. His reply is nothing more nor less than a new mode of advertising his commodity. In this art, (or rather science, as it may be considered at this day,) Mr. Thorburn has certainly evinced the possession of as much and rare talent, as of boldness in its exercise. Sheridan might have gathered additional lights from Thorburn's account of his tree-corn; and would have doubtless added to his satirical classification of puffs in 'The Critic,' the "puff charitable," as the most efficient of all in the list.

JUDGE BUEL.

From the Genesee Farmer.

The wide spread feeling of sympathy and regret, experienced by the public at the unexpected death of Judge Buel, whose decease at Danbury, in Connecticut, has been already noticed in this paper, is fully shown by the numerous respectful notices which have appeared in many of the journals of the day. In somewhat delaying the remarks which the loss of our respected friend and cotemporary seemed to render proper, we have been influenced by the hope of making our notice more full and complete than a more hasty one could have been. We shall, however, be able only to give a general outline of his course, a sketch which will, we hope, be hereafter filled up for the benefit of that public he so long and efficiently labored to serve.

Like Franklin, Judge Buel commenced his career in a printing office, and perhaps a still farther similarity may be traced in the eminently practical turn of his mind, which, allowing but little to mere theory, conceded all to practical utility. He first, we believe, edited and published a Republican paper at Poughkeepsie in Dutchess county; which was followed by another issued at Kingston in Ulster. From Kingston he removed to Albany, where for a number of years he edited and published the state paper, (the Albany Argus,) with ability and success. Judge Buel was a Democratic Republican of the Jefferson school, a plain and forcible writer, and one that treated his opponents with courtesy and amenity. In his office of state printer, he succeeded in saving a handsome property, which he invested in a farm, and to which he retired when he disposed of his interest in the Argus. Judge Buel had not taken an active part in politics for some years, though he was selected as the opposition candidate to Gov. Marcy in 1836.

It is as a skilful and practical farmer; an efficient and undeviating advocate of agriculture, of its legislative aid and protection, and its advancement in all its forms; and as Editor of the 'Cultivator,' however, that Judge Buel will be longest and most favorably known. When he disposed of the Argus establishment, he purchased, much to the surprise of his friends, a tract on the sand plains some two or three miles from Albany, to the improvement of which his first attention and efforts were devoted. This soil was so light, so broken up by clay swamps, and so uneven, that it was considered worthless for the purposes of agriculture, and abandoned to the scanty growth of pitch pines that occupied the surface. As a theorist, Judge Buel thought differently, and the result proved that his reasonings were well founded. He was aware that the sand hills furnished the the means of correcting the clay, and that in the latter a remedy for the lightness and porposity of the former existed. The swamps have been drained, the sand hills leveled, and the whole converted into one of the most fertile and valuable spots in the state. To a skillful rotation of crops Judge Buel owed much of his success; root crops, clover and plaster, corn, and other grains, alternating, and all directed with skill as a source of present profit and a permanent amelioration of the soil.

Judge Buel was secretary to the Board of Agriculture at its first establishment, and a most active promoter of the great objects it had in view. It was principally under his direction and supervision that the excellent papers published in the volumes issued by that board were called forth, and those contributed by himself are not among the least valuable in that collection. As President of the present State Agricultural Society, his labors have been unceasing to perfect its more complete organization and efficiency; and to him and some of his worthy associates we owe much that has been done to awaken the attention of the public to agriculture, and particularly to lay the foundation of an agricultural school that should be an honor to the state, and the class it was especially intended to benefit. If all has not been accomplished for the great interests of agriculture that its friends could have wished, the failure cannot be attributed to a want of exertion on the part of Judge Buel. From the first, he has been the firm and unwavering friend of legislative encouragement and appropriations to the aid of agriculture; to the formation of state and county agricultural societies; and its advancement by every means within the power of the state. For six years past, he has been the conductor of the 'Cultivator,' a paper devoted most ardently and efficiently to the cause of agriculture, and which in ability and utility, has had few equals among agricultural papers in any part of the world. It is here, that his loss to the public will be most severely felt.

Judge Buel was a book farmer, in the strictest sense of the term. His knowledge of the business, of its details and management, had been acquired from books and from observation. He was a farmer *con amore*; because he loved the pursuit, and held it to be the honorable basis of all others. The knowledge he had acquired from books and from reflection, he carried into practice on his farm, with a skill and success that should silence forever the unworthy clamor against the application of science to the advancement of agriculture. He felt his obligations to books, and was never backward in urging upon all, upon whom his influence could be brought to bear the advantage and necessity of a thorough acquaintance with those general principles of agriculture which science and practice have united to develope, and which have been embodied in works devoted to that cause. In no way was his familiarity with those principles and his ability in enforcing and explaining them more conspicuous than in the addresses before various agricultural societies, both in this state and out of it, to the delivery of which for many years he had been frequently called by those who wished to avail themselves of his ability, knowledge and influence; calls which were rarely declined, except from the most urgent necessity. It was in the performance of a duty of this kind that he was arrested by death while among strangers and far from home.

Few men have passed as public a life as Judge Buel, leaving as stainless and irreproachable a character. Mild in disposition, agreeable in his manners, with a deep sense of moral and religious obligation, it is not strange that he had many friends, and those too among those whose friendship is most valuable. A patriot in the noblest sense of the term, he loved and served his country for his country's sake, above those blighting partizan influences which so often serve to check, arrest or chill, the best aspirations of the heart. It was enough that the state or the nation were to be benefited to secure for any cause his cordial co-operation and support. It is pleasant to dwell on such a character as Judge Buel's but we must close with the remark, that by this death the state has lost one of its most honest and honorable citizens, and agriculture one of its most efficient, able and untiring advocates. Peace to his memory.

SWINE. MAKING PORK.

From the Genesee Farmer.

In a very large part of the United States, next to cultivation of grain, the profits of the farmer are more dependant on his pork than any other single item; and within a few years past the sales of that article, it is believed, have equalled in amount that of any other farm product, wheat excepted. It is becoming, therefore, an object of interest to the country, that the best breeds of swine should be selected and disseminated, and the most improved methods of fattening be adopted, as the saving of a single dollar on each porker in rearing or fattening, and experience proves it possible to save many,) would be the saving of millions annually. To these two points, the best breeds and the best mode of fattening, the attention of farmers should be directed.

Fortunately, so far as regards the best breeds of swine, the farmer in the United States has the means of procuring those animals that the common voice of farmers in this country and abroad, have pronounced the best for making pork, and which unite the desired qualities of size, ease of fattening, and fineness of quality. These are the Chinese and the Berkshire; but though the first are superior to all others for quietness, fineness of flesh, and rapidity of fattening, alone they are too small for profitable feeding, and it has been found advisable to cross them with some of the most approved common or imported varieties, in order to give the requisite weight. At the head of these varieties, whether for crossing or for feeding, stand the Berkshire, a breed which if it is of comparatively recent introduction, has, by its valuable qualities, proved itself worthy of a more rapid dissemination than any other breed ever received in this country. That the Berkshire is in equal favor abroad where he is best known, is evident from the following extract which we make from that standard work 'British Husbandry,' and which will also exhibit the principal characteristics of the animal.

"The Berkshire hog is of a reddish brown color with black spots the head well placed, with large ears, generally standing forward, though sometimes hanging over the eyes. He is short legged, small boned, and of a rough curly coat, wearing the appearance of both skin and flesh being of a coarse quality. Nothing, however, can be finer than the bacon, (or pork,) and the animals attain to a very large size, having not uncommonly reached the weight of more than 100 stones; but from 40 to 50, when completely fattened, is the general average. The breed has, indeed, obtained such general approbation from the best judges, that those who wish to improve their stock of swine are very generally desirous of obtaining a cross with that race; and they are consequently dispersed over the most distant parts of the country. Some of the best of these crosses are found in Staffordshire from the progeny of an animal well known to pig breeders as the 'Tamworth Boar.' The native breed is also usually crossed at intervals, either with the pure Chinese or the Tonquin race, and this process is found necessary to prevent deterioration."

To the Berkshire, or to the China crosses, the farmer may therefore look with confidence for the best breeds of swine now in existence; and he who persists in feeding the old fashioned animals, when better are within his reach must find a wide difference between his profits and those of his neighbor, who avails himself of the best animals the country can produce. Hogs weighing eight or ten cwt. have occasionally been produced in this country; but the average weight of our best fatted hogs is much below 400 pounds.

The profits of making pork will depend much on the breed of the animal fed; much on the food used for fattening; and much on the manner in which the process of feeding is conducted. There can be no doubt that some farmers have such inferior pigs, and feed in such a careless and wasteful manner, that they actually lose instead of gaining by attempting to make pork. Almost any hog, and in almost any condition or place, will improve, if you give him enough to eat; but to profitably *fatten*, not only must the food be of the right kind and given in a proper manner, but every necessary attention should be paid to the comfort, cleanliness and health of the animal. The time requisite for fattening is of course dependant on circumstances, such as the condition of the pig when put up, the food used, age &c. From eight to twelve weeks may be said to be the shortest time in which hogs can be properly fattened with good care; and under ordinary modes of feeding, they may require a still longer term to be made of good quality; that is, to have the pork firm and the animal well filled with lard. *Hogs*, when put up for fattening, if well, increase the fastest in weight, and also consume the most food, during the first weeks of their feeding. The rapidity of fattening, and the food eaten, both gradually decrease, but the first lessens most quickly, and after the hog has reached a certain point, his gain will not pay for his feed. When the animal approaches this point, he should be killed. A *pig put up* to be fattened and regularly weighed, gave the following results, which are conclusive on this point, and they agree in the main with the experience of every farmer.

Oct. 10.	Weight of pig,	36 st.	7 lbs.		
Oct. 24.	" "	41 "	5 "	gain	38 lbs.
Nov. 7.	" "	45 "	7 "	"	34 "
Nov. 21.	" "	47 "	2 "	"	11 "
Dec. 5.	" "	48 "	7 "	"	13 "
Dec. 22.	" "	48 "	6 "	"	1 "

To insure economy in the making of pork, it is indispensable that a suitable piggery be provided. The particular manner in which this building is constructed is of comparatively little consequence, if it unites the essential requisites of such an important part of the farm buildings. It should be convenient; that is, it should be so arranged that the labor of feeding the swine may be diminished as much as possible. At the present time a large portion of the food of hogs is cooked, and the apparatus for cooking and the place of feeding should be near each other. In some of the best arranged piggeries, the furnaces, steamers, kettles, pumps, &c. are under the same roof with the pig stye, and the labor of feeding ten or twenty porkers for eight or ten weeks is materially diminished from what it would be where the cooking is performed in the open air, and at a distance from the pen. The pen for the animals should be so arranged that it can be readily cleaned and kept dry, and in cold weather a bed of straw or litter should be furnished, as no hog can fat well unless he is kept warm and comfortable. Too great a degree of warmth, or too great a degree of cold, seem alike unfavorable to making pork; hence the fall and the spring months are better for this purpose than the summer or winter ones; though in a cool or shaded situation, and on a bare floor, hogs will take on fat as rapidly during the warm months as at any other time. The troughs for feeding must be secured by stanchells, or by pins crossing their upper surface in such a way that all the pigs may obtain their share, and not allow a cross domineering porker to place himself lengthwise in the trough, or run his nose at will from end to end, to the utter discomfiture of the more peaceably inclined. A lid to the trough should be prepared and hung in such a way that the pigs can be shut from the trough, until the food is put in and properly distributed; a thing easily done, and which will prevent a vast deal of squealing and fighting. A farmer should know that it does not sound well, or bespeak, good management, to have his pigs make such a clamor every time he is about to feed them, as to make all the neighborhood acquainted with the important fact. The size of the piggery will of course depend on the number of animals it is intended to fatten; as a general rule about two feet of trough should be allowed to each animal, though a much less space may be made to suffice; especially, if the precaution of dividing the trough into sections has been adopted. Where it is intended to feed a large number, the space or building for the fixtures, (steamers, kettles, &c.) may be made the centre, and the styes arranged around it, so as to make the management of the whole easy. The slovenly manner in which some persons keep their swine, and the disgusting state of their piggeries, especially since the practice of feeding the animals on steamed food has become common, is truly disgraceful, and forms a serious drawback on the profits of feeding, as it is clear that a hog so treated will not take on fat or be as healthy, as one kept as a swine should be.

According to an article in the British Husbandry, a system has been adopted by some of those most extensively engaged in the pork business which appears to be a great improvement on the old method. The styes are built in divisions, each to contain a pig, and to fit him as near as may be. At one end of this bell is the trough, at the other a sliding door that shuts in the pig. No litter of any kind is permitted, as the stalls are on an inclined plane, and cleaned out every day. Holes are bored in the floor to allow all moisture to escape. Some have carried the system so far as not to allow the width of the stall to be sufficient for the hog to turn in, but whether standing or lying, he always remains with his head to the trough. The advantages of this mode are supposed to be, that the hog keeps more quiet; has a clean dry stye, is sure of a sufficient supply of food without fighting for it; and as a necessary consequence fattens much faster. Suppositions which have been justified by the result of many experiments.

As to the kind of food best adapted to making pork there can be but one opinion where Indian corn is grown. Fed to the swine in the ear, ground or cooked, it is alike superior to all other kinds of food for making pork of the best quality. Various experiments have been made in preparing corn for food. By grinding the cob with the corn a great saving was effected in the quantity of grain used, though the fat did not seem to be taken on quite so rapidly as when fed on pure meal. Cooking the corn, or making it into pudding is probably the best way in which it can be fed, as it is certainly the most economical; giving the bulk necessary for the proper distention of the stomach, with a better development of the nutritive matter than can be obtained in any other way. Making the meal into a mash, with milk or whey, is also a good method of preparing it. In this case it is the better if soured before feeding.

Where corn cannot be grown, the most valuable kinds of food are peas and barley. In England where corn is unknown, the process of fatting is usually conducted as follows. "In order to harden the flesh, and render it of that mellow firmness so essential to fine pork or bacon, some people commence with about two thirds of steamed potatoes, and one third of peas and barley ground in equal proportions into meal, enlarging the quantity of meal as the animal grows fat, by which means it is said that a quick feeder will in twelve weeks consume from 14 to 16 bushels of the grain, and will probably double his weight. One bushel of peas to four of oats, or four of barley, or three or four bushels of potatoes, with two bushels of ground oats and barley boiled, are also considered good mixtures; but nothing in this country is equal to barley meal and white peas—the peas being given whole, and the meal made into a mash with skimmed milk." (See 'Brit. Husbandry') In this country some good farmers consider a mixture of oats in the proportion of one bushel of oats to three or four of corn, so essential, that we have heard them assert that rather than not have the oats for the mixture, they would exchange corn for that grain, bushel for bushel.

For several years past a large proportion of the pork in the northern states, has been mostly made from apples or potatoes, or from a mixture of these, with meal added for a few of the last weeks of feeding to give the requisite firmness. On apples or potatoes, particularly if steamed, as they always should be, pigs thrive very rapidly, and will in time acquire a very good consistence of flesh as well as weight; but they must be fed for a longer period than when meal is used. Barley has also been extensively cultivated for making pork, as a substitute for corn and peas, and grown for the same purpose by many farmers. Some of the heaviest, finest lots of pork we have ever seen, were made from peas simply prepared by swelling them in tubs with water, and feeding them with milk. As a general rule it may be stated that all food for animals, certainly for fattening ones, should be cooked. In order to thrive rapidly, and take on fat as a hog should, to render making pork profitable, the nutritive matter should be presented in a way that will require little or no expenditure of animal or vital power for its appropriation. The following statement will exhibit at a glance the advantages of so preparing food. "Mr. Walker of Ferrygate, on the 4th of March put up two lots containing five pigs each of the same brood, and two and a half months old. They were separately fed, the one on steamed and the other on raw potatoes, with an allowance of two and a half lbs. of broken barley daily to each lot; the barley for the steamed lot being prepared along with the potatoes. The live weight of the two lots were—

That on raw food,	108
That on steamed food,	106

and the following table exhibits their several improvement:

March 19, pigs on steamed food, 114 lbs. " " raw " 111	difference in favor of steamed food 3 lbs.
March 30, weight on steamed food 137 lbs. " " raw " 123½	do. 13½
May 1. weight on steamed food, 205 " " " raw " 175	do. 30
June 1, weight on " " steamed food, 279 " " " raw " 223	do. 56

Thus in three months the pigs on steamed food had increased 172 lbs.—being 67 lbs. more than double their original weight while those on raw food only gained 115 pounds. In another instance, two lots were fed on steamed, and on raw potatoes, and in ten weeks the lot fed on steamed food gained 38 stones 6 lbs. and the lot on raw potatoes, 17 stones 11 lbs. making a difference in favor of the steamed food of 360 pounds.

Our experience is also decidedly in favor of steaming or cooking food for swine; but it should not be forgotten, that in order to make profitable pork for cooking, it is indispensable that pigs fed on apples or potatoes should have meal mixed with their food; the quantity to be increased as the feeding approaches its close. With this precaution the general introduction of the plan of fattening swine on steamed apples, or apples and potatoes, or either alone, is one of the greatest improvements of modern farming, adding materially to the profits of the cultivator of the soil, and furnishing a first rate article for the market.

"JOTTINGS DOWN" IN THE SWAMPS.

By the Editor.

No. I.

Blackwater and Chowan rivers, and the mouths of the Roanoke.

Plymouth, N. C. Nov. 19, 1839.

The singular features of the upper Blackwater river, or swamp as it is called above the limit of navigation, have long ago attracted my attention; and more than once I have attempted to induce the landholders on its borders, and the public, to appreciate its neglected *capabilities* for improvement, both for navigation, and for the drainage of the extensive swamp lands on the upper waters.* But it was not until yesterday that I had an opportunity of seeing its now navigable course, and of finding that as remarkable though different features belong to its lower as its upper waters. Even to this time, almost no use is made of this excellent navigable route, except by the small steamboat which runs regularly from the junction of the river with the Portsmouth and Roanoke railway, to Edenton and Plymouth; and this vessel carries little except passengers. That almost no use should be made of this river and also of the Nottoway and Meherrin, for transporting country produce, is owing to the almost closed state of the lower waters and ports of North Carolina, and the consequent low prices which can be there given by merchants.

The Blackwater, from its head spring, which is within two miles of the lowest falls of the Appomattox, is remarkable for its level and sluggish course. It has not a rock, and perhaps not a pebble, in the whole of its long route; and nothing obstructs the passage of its waters, except fallen trees, and the rubbish which has collected above such stoppages. These obstructions have long ago choked up the upper waters for many miles below the head; and have raised the general level of the water, and kept the extensive swamp covered with the impeded water until dried by evaporation; and the acts, as well as the neglect, of the proprietors have been continually operating to render the stream as useless as possible, and to render the swamps irreclaimable, (under our stupid legal policy,) and unproductive of every thing but malaria, sickness, and death. If the law of Virginia had not (effectually though indirectly) forbidden the draining of the swamps of the Blackwater, it might have been done, and 20,000 acres of the richest soil have been made dry and productive, by an expenditure of less money than has been paid in physicians' bills, for the sickness caused by these swamps, and the worthless mill-ponds at the heads of the branches. But this is digressing from my present subject.

At the steamboat landing, and for some miles lower down, the width of this river is sometimes not more than 70, and seldom is 100 feet wide, and this narrow space between the shores is still more lessened by the overhanging branches of the trees which grow thickly on the borders. Then so crooked is the course, and abrupt the turns, and so much are the changes of course shut in and concealed by the sameness of appearance on both sides, that the river presents continually the appearance, (though a continually changing appearance,) of a little narrow lake. Yet the water is deep enough throughout to float a frigate. Though as black as its name correctly purports, the river was clear of all muddiness. The still and dark waters margined and over-hung by the thick forest growth of the swamps, seemed to belong to the most silent and gloomy solitude of nature; and the contrast was even unpleasant which was presented by the introducing of a thing so noisy and so highly artificial as a steamer in rapid progress.

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* Farmers' Register, p. 532, vol. iv.

The entire space between the high-lands is a low swamp, elevated but a few inches above the ordinary height of the river, and of course always wet and miry. The river continually changes from one side of the highland to the other; and therefore it always has swamp land on one side, and generally high land on the other. The character of the swamp was conjectured merely by what was seen from the vessel; but from its little elevation above ordinary or low water, still more than from its being covered by every fresh, I consider it as both irreclaimable and worthless.

Though the leaves had mostly fallen, there were still enough of many kinds of trees and shrubs clothed in their brilliant and varied autumnal tints, to show how much more beautiful this river must be at an earlier season; in May and June especially, when the abundant woodbine and other vines are in blossom, and the dense forest has its richest verdure.

The margin of the river on the swamp side is throughout a dike formed by nature, but so regular as to appear like an ancient construction of art. It is generally above four feet high, and wide enough for a road. Indeed a part of it, of nearly a mile in length, in the lower part of Southampton county, in location happens to suit, and is used as a public road. This natural embankment is obviously the result of the deposite of sediment by the overflowing water, and which here, as on most other streams drops the heaviest and most abundant portion quickest, and of course nearest to the stream. But the wonder here is, that this operation should have been so regular—and by a stream which very seldom has suspended in its water any perceptible earthy matter, and never any of coarse or sandy kind as this is. When this ridge was deposited, the character of the stream must have been very different from what it is now.

There is but little change of appearance in the Blackwater, until it loses its name by junction with the Nottoway, at the North Carolina line. The Meherrin soon after joins also, and the united waters are known as the Chowan. The swamps, which had been more and more taking the place of the high-land margin, were now generally stretched along both sides. And the river rapidly increases in width, until, before joining Albemarle Sound, the Chowan is six miles in width.

All the former *inlets* (as they are called) of the ocean, or rather *outlets* of the rivers and of Albemarle Sound, being now completely shut up by the sand, and the pent-up floods having to seek their difficult passage as far south as Ocracock inlet, the level of the waters has been raised above their former limit. On account of the same separation from the ocean, there is no regular, and scarcely any perceptible tide in the sound, and its water which formerly was salt, is now fresh. There are no better waters in the world for the navigation of vessels of the largest size than the Albemarle Sound and the rivers which flow into it. Yet vessels of no more than five feet draught can now be used on these magnificent waters, because no greater depth can be carried, and that through a long and dangerous passage, to the ocean. The best outlet to a market is through the Dismal Swamp canal, notwithstanding its deficiency of depth and width, and the cost of tolls. One of the most magnificent, and at the same time one of the most useful of public improvements, would be to increase this canal to such size as to admit the passage of ships. Then the great rivers of North Carolina could be put to full use; and at the same time the passage of ships to the ocean would be made as cheap, and far more safe and sure, than if a ship channel could be opened through the wall of shifting sand which binds the coast.

Albemarle Sound, though crossed at the upper and most contracted part, and seen on my passage only by bright moonlight, still appeared a magnificent sheet of water. Our course to Plymouth was up one of the several mouths of the Roanoke, with swamps on both sides still, and more extended and impenetrable than any passed before. These different passages of the Roanoke form several large islands, which are all of low swamp, except small knolls of firm ground which rise a little above the level of the adjoining swamp. One of these islands, Guard Island, in the interior is a juniper swamp, and has bears and rattlesnakes among its inhabitants.

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No. II.

Margin of the great swamp. State of agriculture.

Plymouth, N. C. Nov. 20th.

Yesterday was spent in viewing some of the farms of this neighborhood, embracing some of the richest land in the world, and some, of the poorest and the worst managed. For my guidance, and for the facilities and information without which the observations of a stranger would have been very illy directed, I was indebted to the kind attention of Dr. Armistead, whose farm, two miles from Plymouth, was the most closely examined, though a slighter view was taken of various other properties, within a few miles distance.

Four-fifths of this county, Washington, and perhaps as much of the adjacent counties of Tyrrel, Hyde, and Beaufort—all the extensive peninsula, indeed, formed by Albemarle and Pamlico sounds—is one immense swamp. This whole peninsula, is about 60 miles long, by 40 wide. The part which is not swamp (estimated as one-fifth of the whole,) is composed of the narrow knolls of firm soil which are scattered throughout —islands of sand, or of clay, in a sea of black mire.

I was prepared by my former view of the Dismal Swamp in Virginia, to find this land similar in character, and fully as much of purely vegetable formation as the former. But such is not the fact. I saw one juniper swamp only; and though its under-growth was so thick that I could not penetrate it far enough for examination, no doubt its soil is of the same purely vegetable formation as the juniper lands in Virginia. But with this exception, all the swamp land seen, has been of what is called "cypress and gum swamp;" and which, judging from the small portion which has been drained and cultivated, is of very great and also very durable fertility. This soil has certainly much vegetable matter; but much of earth also; is about 2 to 2½ feet deep, and resting on a subsoil of what appears to be a tenacious blue clay, when first dug up, but which becomes pulverized by exposure, and forms fertile soil. No doubt the soluble vegetable matter has sunk into this clay, and given to it both its color and its productive power. I never saw any soil that appeared richer than this land, or that promised a greater profit upon the expense of improvement. Still, very few persons have yet begun to drain their swamp lands, and all their cultivation is on the firm knolls, which were never rich, and are now very much reduced by the unceasing cultivation of corn, year after year, which is the general practice of the country. The sole mitigation or change of this course, (if it be either,) is, that peas are always planted among the corn, and the land thus made to bring two crops in each year. But the peas are gathered as well as the corn, and then stock turned in to take all that is left; so that nothing of the crop is given to the land as manure.

The soil of these dry knolls is generally sandy; but sometimes quite stiff. The latter is much the meanest soil of the two, for product, and also the least manageable under cultivation.

The mere observation of the map of North Carolina will show this remarkable peculiarity, that all the numerous streams have their sources in the interior and central parts of the swamps, and thence flow, some in every different direction, to seek lower outlets. This is not only the case as to the great swamp region now under consideration, but also as to the other great swamps which lie south of the Pamlico. This general fact alone would clearly prove that the great body of the swamp land is generally higher than the dry and firm soil which lies without, and through which the swamp streams, which in some cases are large and navigable rivers, seek their passage to the two sounds. It is not meant that the swamps at their edges are higher than the outer firm land immediately adjacent. On the contrary they are lower; but gradually rise towards the interior, and each long and narrow ridge or knoll of firm ground that is reached seems a low step or dike to a higher elevation of swamp within. In my former slight examination of the Dismal Swamp in Virginia, I was struck with, and invited attention to, the like fact of the swamp being higher than *nearly all* the surrounding country, dry, firm and elevated as the latter was. But still there was on one side, (the western,) which I did not visit, higher land, from which streams *might* flow into the swamp, and help to supply the vast superfluity of water, which passed off in every other direction. But even if such is the case in Virginia, (which I now doubt, or suppose at least that the supply of streams from without is of but secondary importance.) it certainly is not so in North Carolina. Whence then can be derived the great supply of water which not only keeps saturated this vast extent of morass, but fills, and keeps full, several lakes of considerable magnitude, and feeds, through all seasons, numerous streams and even deep rivers? Can the rain water alone be sufficient to produce such great results? Or can there be an additional supply from below, in undiscovered and unsuspected springs, and abundant enough in supply for the great effect produced? If reasoning *a priori*, I should have inferred that in a climate as warm as this, and having no more rain, that all the rain that fell on a before dry and level surface, and retained there for want of fail to an outlet, (and therefore to be wasted only by absorption of the earth and evaporation,) could not serve to maintain wetness through all seasons, and consequently could not form a morass. *But even if* this inference is erroneous, and permanent swamps would be thus formed by rain water alone, retained exactly where it fell, there is yet a much greater and more inexplicable effect produced here, where numerous and large streams are perpetually drawing away the waters of the swamp, and of which moreover the land is so elevated that the rain water may flow *off*, but cannot possibly be increased by flowing *to*, from other lands.

The channels of the streams near where they pass out of the swamps, being deep enough, may well be used to receive the canals, or main-carrier ditches, made to drain the outer parts of the swamps, which are the lowest parts; and to prevent these parts being again flooded from the interior and higher part of the great swamp, some of the numerous long nnd narrow ridges may be used as natural dikes or barriers. The only lands that I saw or heard of in this neighborhood, on which draining had been commenced successfully, were the farms of Dr. Armistead and Mr. Swift; the former being much the more advanced and considerable operation. The proprietor, though with but short experience as a farmer and drainer, and his work therefore necesarily imperfect and insufficient, still has effected a great and admirable change, and which has already been attended with great profit. His main-carrier is upwards of two miles in length, twelve feet wide, and about four feet deep; which depth is not enough by two or three feet, which addition the proprietor designs to give as soon as can be conveniently done. This canal passes through the middle of his swamp land, and serves to drain and to fit for *putting to* use the whole body of about 500 acres. *It empties* into a swamp creek. Still, the overflow of water from the interior swamp could cover *the head of* this canal, and render it incapable of *discharging* even one-tenth of the supply; but that has been guarded against by a short dike which has been made to unite the adjacent ends of two of the long ridges, and which, thus united, form a perfect defence. But it is enough, and more than it can now do, for the canal to discharge all the water from heavy rains which fall on the area it is designed to draw from. In each of the three last years there has been a storm of rain and wind in August or September, which overflowed the drained swamp, and all its cultivated portion, *from two* to three feet deep, notwithstanding all the discharge of the canal. This glut of water on such disastrous occasions was no doubt much increased by the wind blowing down the dead trees, and their tops falling into and partially choking the canal. The crop of corn now on the ground, though a very heavy product, offers evidence of the destructive effect of the wind and the flood of last September. The enlarging of the canal, and the entire destruction and removal of the dead trees, will greatly lessen, if not entirely guard against such evils.

The swamp in its natural state is one uniform expanse of the most gigantic and magnificent forest growth; of cypress and blackgum and other aquatic trees mostly, but with some mixture of others more usually found on dry though low land. Vines and shrubs, of various kinds, form the undergrowth. The whole surface of the earth is kept always (unless in winter) under an impenetrable shade. This dense cover of course must much obstruct evaporation, and, when removed for tillage, will greatly lessen the first supply of water to the drains.

The first operation, after digging the main canal, is to kill the trees, which is effectually done by slightly "belting" them, or cutting around through the bark and a little into the wood. Whether this is done in winter or summer, the trees die within one or two years after; and (what was different from my experience and expectation,) no new sprouts grow out from below the belt. Several persons who *intended* to drain, commenced their operations by thus killing the trees. But unfortunately, this was also the *end* of their improvement. In such cases, a new and thick growth of altogether a different kind rapidly covers the land, which if left undisturbed for a few years, would be more difficult to destroy than the original forest. I saw one piece of second growth thus produced. Nearly all the trees were of a species of magnolia, with a very deeply corrugated yet close and firm bark. These beautiful trees were from six to even twelve inches in diameter, with long straight bodies, clear of limbs to a great height; which manner of growth is common to all kinds of trees in the swamp. But if brought under tillage in proper time, the drained swamp land is easy to plough, and to manage and get in good order in all respects, excepting the labor of successive and complete removal of the enormous quantity of large decaying trees.

While the trees are dying, and a year before beginning cultivation, many parallel small cross drains are cut, emptying into larger ones running at right-angles, and these again into the main canal. These small drains are from 100 to 200 yards a part, and are covered. They ought to be dug 3 feet deep, and the wooden covering to be 2½ below the surface. For want of such depth, some have already failed, and have been re-opened for repair. There could be no better subsoil in which to make covered drains, as the bottom is always in the adhesive blue clay. In this a narrower channel is dug, to serve for the pipe, leaving shoulders of the clay, on which, and across the open pipe below, short split boards of heart-cypress, (which is almost imperishable,) are laid. Dr. Armistead thinks that, in addition to the great convenience to cultivation of *covered* compared to *open* ditches, that the former serve even *better* to take in the water by filtration, than the latter do by its flowing in; for so level, and so porous is the soil, that, even when overflowed by a heavy rain, the water scarcely runs at all into ditches, but rapidly disappears by sinking into the earth. But though a strenuous advocate for covered drains where they are suitable, and having had much experience in their construction and of their benefits, I fear that objections to them, though not now suspected, will be found hereafter; and that their present efficacy is owing to what will ultimately cause their filling up and destruction as drains—that is, the ease with which the surface-water finds a passage into them. Wherever water can descend through cavities, it will certainly carry along with it more or less of fine earth; and the little descent in the course of the drains will cause this earth to remain in, and at last choke the pipe. And if such should not be the result, there may be another opposite evil nearly as great. As the vegetable part of the soil shall decay, the texture will become closer, and water cannot, as now, sink into the earth, or through the covering of the drains, and, of course, in the same proportion will the operation of the drains be lessened. Though so much more troublesome during cultivation, I should prefer a smaller number of deep open drains, into which should empty the deep and clean water-furrows of wide and high beds. However—where every thing is so new to me, it is my business to gather and receive, instead of offering to give instruction to others who are better, because more practically informed, as to the peculiarities of this soil. The main canal on Dr. Armistead's land not only needs deepening, but the smaller drains are yet to be dug for much the greater part of the land, which the canal will serve to lay dry. Of more than 500 acres which will be so drained, and for which the most expensive work is done, only 180 acres have been yet made ready for cultivation. From that, (principally, for his highland is of the general mean quality,) he counts on making 1500 barrels of corn; and certainly he has made a most splendid and profitable addition to the previous state of his property. This land is usually estimated, as I was informed, at less than a dollar the acre; and for that price any quantity may now be bought. The draining upon a proper plan and a large scale would be far from expensive; and when drained, the land would be well worth $50 the acre, if the most fertile land in the country is worth that sum. If its durability will be equal to its fertility, it would be cheap at $100 the acre. Yet almost every poor landholder in this county, who is barely feeding his family by the incessant tillage and exhaustion of the poor narrow ridges, also owns of this swamp what would make a princely estate. But it is not only the poor and the ignorant, but the rich and the better informed, who neglect this incalculable source of value. For with the exception of a very few such improvements, (the most important of which I have not yet seen,) the drainage of the swamp lands is either not thought of by proprietors, or considered as among the many visionary schemes of book-farmers.

If drainage were effected even to but slight extent, this region ought to be one of the best for grass husbandry, and for cattle. But the making of hay is not thought of, though so much of the land is so admirably suited to grass. The reeds and other grass of the swamps in their natural state would make most valuable pasturage for cattle; and still better for hogs, with what they would get by rooting. But the bears are so numerous and destructive to both hogs and cattle, that there is little gained by their rangihg at large in the swamps. Bears very rarely venture into the cultivated lands; and never leave the swamp unless forced by hunger. Yet so plenty are they in their haunts in the great swamp, that one man in this neighborhood, (of course a great bear-hunter,) killed sixteen in one season, the fall of 1838.

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No. III.

Journey over the firm land of Washington county. First impressions of the great swamp, and Lake Scuppernong.

Somerset Place, Nov. 21.

Having been most kindly invited by Josiah Collins, esq. to accompany him to his place of residence, and promised his aid to enable me to see the swamp lands where I had heard had been made the most successful and interesting improvements by draining, I readily availed of his offer; and this morning we left Plymouth. Our road was necessarily on the only long and nearly continuous stretch of dry land in the county; and was very circuitous. All of the central and southern part of the county, through which a direct route would have led, is part of the great swamp, and of course impassable. The road is on the lower yet firm land near the shore of Albemarle Sound, and for 4 or 5 miles we were with a mile of it, and generally within a quarter of a mile, and in full view of the trees on the opposite side. The water however was but seldom and barely visible, owing to the low level of the road. This firm ground is supposed to be not more than of 10 feet elevation above the water of the sound, and of course is lower than the main body of the great swamp. But whether of the sandy or the clay soil, (as before described,) the land was firm, and the road excellent throughout. Though wider than the smaller ridges, the land generally was of the same kinds and alternations of soil. The swamp growth was often in sight, on one or both sides. After turning southward, from the neighborhood of the sound, we crossed the outer part of Poplar Swamp, a projecting portion of the main body, and which, like that in general, is now covered several inches deep in water, though no rain has recently fallen. Afterwards we passed through a part of what is called the "body land," being the largest body of firm land (7 to 8,000 acres,) and having uniform and peculiar qualities. This is very level, and a close stiff clay soil, which, though firm, requires draining to remove surface water, and without that operation being well executed, the land is worth very little. This draining was not done, or very imperfectly, for a long time; and during that time, the people living on this land supposed that it was not capable of producing them bread. Accordingly, they either cultivated corn on some poor sandy spot in the neighborhood, or bought it with what they gained by cutting lumber, which business was, and still is, the general source of income, here and elsewhere in this county, except the little corn and less wheat cultivated. But since having been sufficiently drained, this "body land" brings good corn, as I saw standing, and very heavy crops of wheat. Some of it has produced 30 bushels of wheat to the acre.

On several of the small farms passed in the day's journey, were seen the Scuppernong grape vines, trained in the manner usual in this part of the country, and on Roanoke Island. One or more vines, (which appeared to be three or four inches in diameter,) rose perpendicularly about 7 feet, to the top of an open horizontal frame or scaffold, raised on posts, and over which the branches spread, and thickly cover. A single vine will cover, and closely shade a wide space; and as the growth spreads, the frame is extended. The Scuppernong is a native grape. The fruit is white, very large, and grows not in bunches, but singly. It is, to my taste, delicious, and is also a good grape for wine, of which some that is very palatable and much that is bad, is made hereabout.

We crossed Scuppernong river on a draw-bridge. The river is a narrow, but deep, and navigable for sea vessels for a mile above the bridge. It has the same general appearance of all the small rivers of this country, its waters being black and sluggish, spreading far over the low and wide swamp on its borders. Having passed out of this river swamp, our road again rose into high-land or firm soil, and generally under its original highland forest growth. So far, for more than 30 miles the road had passed through lands as devoid of interest as any whatever. But soon after this, notwithstanding my having been somewhat preprepared by previous general description, it was with no less surprise than pleasure that the scene was seen to change, and successive works of industry as well as of nature were successively reached, none of which could have been otherwise suspected of existing in such a locality. The road, while yet on high or dry land, first brought us to the margin of a wide and deep navigable canal, down which the water flowed with a fulness and degree of rapidity which afforded evidence of an unusual rate of descent.

The canal stretched out of sight in a *perfectly* straight course both above and below, and apparently (as really) for miles in extent. One of its banks had been formed into a wide and excellent road, along which was our still ascending course, meeting the direction of the flow of the water. After proceeding thus, and the land obviously still increasing in elevation, our route rose from a highland and firm soil to swamp land, having its usual and marked peculiarities. We had indeed just entered the border of the great swamp region, and our course was towards its interior. The land here on both sides was a wet morass, though not inundated, and was principally covered with evergreen trees, so that the verdure of summer was generally presented, when every thing else showed the hues or nakedness of winter. The most numerous and largest of the evergreens are of the same species of magnolia before mentioned, and which is called the black laurel. Some here are more than two feet through the body. It is a beautiful tree, on account of its glossy and bright green leaves, and its long and very straight body; and much more pleasing to the eye were these trees where they formed the almost entire and thick growth.

Next we reached cleared and well drained swamp land, under a heavy crop of corn, of which the growth covered a single field of some 600 acres. The rich soil was quite dry; yet its appearance, as well as the large intersecting ditches, and the yet standing dead trees, all showed clearly enough that it had formerly been swamp of the same character as that on which still grew the native forest of gigantic cypresses, which bounded the prospect beyond the cleared land. A-head of us, and still distant, now were in view various buildings, so numerous as to seem a village. The increased rapidity of the current, as well as the ascending course of the road, which was now manifest to the eye, showed that the land was still more and more elevated. The mills on the canal, and some other large buildings had narrowed the view ahead; but when these were passed, and the upper termination of the canal nearly reached, its great and magnificent source, Lake Scuppernong, opened gloriously to my view, and a few moments after brought us to its margin. The position of the mansion house barely permits the passage of the road between it and the canal; and the house is also so near the lake, that the spray from its billows in great storms would cover the space between, but for the few cypresses standing in the edge of the water, and other barriers against the violence of the waves.

Across the lake from the canal stretches the great savanna on the opposite shore, and which is scarcely visible, owing to the low size of its general though dense growth. The few scattering high trees thereon, seem to be standing in water, and not on land. The other sides are closed with a dense cypress forest, of the usual great height. In general appearance, at the first glance, this lake is alike to Lake Drummond in the Great Dismal Swamp of Virginia. But the first impressions of both still are very different. Over the latter, it would seem to a stranger that nature reigned in gloomy solitude that had never before been disturbed. With Lake Scuppernong, the works of man stand in strong and conspicuous contrast to the natural scenery and the general condition of the vast and impenetrable morass in which are concealed both this beautiful creation of nature and that of the rare exertion of the industry and intelligence of man; and in a region where these qualities, or their proper direction, seemed scarcely to be in existence.

Of course, I had been prepared in some measure by previous but very inaccurate report, for the remarkable scene now spread before my view. But if it were possible for a person not so informed to find his way to this spot, by a journey over the only practicable path—and still more if the last few miles were through the intervening trackless swamp, yet remaining in its natural wild state—the *unexpectedness* of the objects found would be even more striking to such an observer than even the actual romantic and peculiar beauties of the scene.

The first discovery and earliest knowledge of this lake was in 1755. Some hunters who had for years dwelt within three miles of its shore, on some of the small "islands" or spots of firm ground, had observed that the deer when pursued, usually ran off in a particular direction, from which the dogs soon returned, as if baffled in their pursuit. Thence it was inferred that some wide water lay that way, in which the deer found a safe refuge. These hunters at last determined to attempt the arduous labor of penetrating the swamp, scarcely passable as it was then even to them, and to find the great water, if it existed within the short distance that they suspected it to be. They set out for this purpose, and worked their slow and toilsome way through the day, and lodged, as well as might be, where night overtook them. The next morning, discouraged by the difficulty of further progress, and fearing to add more to the toil and danger of their return, it was agreed to abandon the adventure forthwith. But before turning their steps homeward, as a lost resource, one of the party, Tarkinton, climbed one of the tallest trees, and from its top, had the first view of the broad waters of the lake, and at no great distance. His joyful exclamations, announcing the discovery, and its direction, induced one of his less zealous companions to try to seize upon the honor of first reaching the lake; and he immediately pushed on in the direction indicated, and had leaped into the water and claimed for it his own name, before Tarkinton could descend the tree and overtake him. Thus was the name of *Phelps* attached to the lake, as contrary to justice, as to euphony and good taste. But in old records it was also sometimes called by the Indian name of Scuppernong, being the source of the river before and still so called; and that name, of better sound and better application, ought by all means to supersede the use of the other.

(To be continued.)

MANAGEMENT BETTER THAN BEATING.

From the American Farmer.

A truckman in Boston, who had a refractory horse, that would not move forward, beat him unmercifully. A gentleman came along, who told him that he must not beat him any more. "What shall I do?" said the man; "my horse has stood here these two hours. Shall I stand here all day?" "Oh no, the horse must go, but you must not beat him any more. Get me a rope twice as long as the horse." The rope was brought, tied to its tail, and then passed between his legs forward; then he gave a pull upon the rope; the horse was frightened, and showed signs of kicking; he continued to pull; the horse suddenly started forward, and went off without any more beating. The gentleman had seen that method tried on jackasses in South America with full success. If you doubt it, try for yourself.

OF THE [ANCIENT] CURRENCY AND VALUATION OF COINS IN VIRGINIA.

From Beverley's History of Virginia.

"The coin which chiefly they have among 'em, is either gold, of the stamp of *Arabia*, or silver and gold of the stamp of the Spanish America: but they have now very little money there, and are still like to have rather less than more, while matters remain in the ill condition they are. For while they are forbid raising the coin, and the neighbouring governments all around, are allow'd to enhance the rate of it with them, to above thirty *per cent*, more than the intrinsick value, all their money will be carry'd thither, which seems to be the greatest hardship in the world, upon that colony. It were much to be wish'd, that all the colonies of the continent under the dominion of *England*, were oblig'd to have one and the same standard for their coin: that so one government might not suffer by the unreasonable advances of another. The inconveniences to *Virginia* by the drawing away all the specie are inexpressible. For people want money for travelling expenses, and for paying the small jobbs of labourers and artificers, who could otherwise have abundance of time to themselves, which is now lost in looking after trivial debts, besides the disadvantage of not being able to turn the penny. By having no ready money, many law-suits commence to demand those debts, which by this means are contracted, besides the being forc'd to keep a thousand unnecessary accounts."

MONTHLY COMMERCIAL REPORT.

For the Farmers' Register.

The news from Europe to 1st November, is not of a favorable character, and worse tidings are expected by the next steamer, when the accounts of suspension of specie payments in this country shall have been received there. American stocks were at very low rates, and were unsaleable even at the great depreciation which they had reached. The very reduced stock of specie in the Bank of England, although it may not cause a suspension, must render money very scarce, and the probable deficiency in the grain crop is likely to protract the distress which has prevailed for some time past. The inferior quality of the wheat causes prices to be kept down, and consequently enhances the rate of duty—thus rendering the exports from other countries less extensive than they would be if commerce in grain was unrestrained. The price of flour in this country is consequently kept down to the comparatively moderate price of $6¼ to $6½ in the ports of shipment. Wheat $1 15 to $1 25.

A combination of circumstances operates against our great staple, cotton, which the short export from this country is insufficient to counteract. Even the impression which prevailed that another short crop was to succeed the last, was not sufficient to affect prices favorably; and this impression will be removed when later accounts from this country shall be received. The unusually favorable season for maturing the plant and gathering the crop, now gives assurance that the product will be most abundant, and prices are likely to be as low during the ensuing year as in any previous one. The manufacturing interest in the United States is in a very depressed condition, as indeed is almost every other. In the large southern markets the price of cotton has continued to decline until the quotations are reduced to 9 to 11 cents, with prospect of further reduction.

The very limited product of tobacco in 1838 causes the price of that article to be better sustained abroad than of any other; but the abundant crop of the present year will be sufficient to fill all markets, when the period of export shall arrive. The moderate supplies of new crop which now appear at our inspections command a ready sale at $4 to $8.

Our internal exchanges continue in a deranged state. The banks of New York and of the eastern states adhering to specie payments, causes southern funds to be at a discount there of 8 to 12 per cent.; and remittances from one part of the country to another are rendered almost impracticable. Exchange on England during this month has been at 103 to 108 in New York, while in the cities south of it 118 to 120 has been current.

Stocks of every description have fallen to lower rates than at almost any previous time, and the pressure for money never was more severely felt.

X.

November 30th, 1839.

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VALUABLE JAMES RIVER LAND
FOR SALE.

Will be sold to the highest bidder on the premises, on the 27th day of December next, if fair, otherwise the first fair day thereafter, under the will of the late Richard H. Edwards dec'd., that beautiful and valuable farm in the Co. of Surry, on which the dec'd. resided.

This farm lies about five miles below Surry C. H., and immediately on James River, of which there is a beautiful view. The tract contains about 700 acres of land; the soil of which is well adapted to the growth of Corn, Oats, Cotton, Palma Christi, &c. &c. Nearly 3-4ths, of the arable land has been marled, and is now in a state of rapid improvement. The marl on this farm, of which there is an immense quantity and very accessible, is as good perhaps as any in the State, having a considerable quantity of green sand intermixed with it. There is a valuable grist mill, with two pair of stones, on a stream which has never been known to fail under the severest droughts, attached to the farm, and will be sold with it; also a valuable marsh, from which large quantities of hay are annually cut. The improvements on the farm are numerous and valuable, to wit: A large and commodious dwelling house, with four rooms and a large passage on the first floor; kitchen; meat houses; barns; stables; a dairy; an ice house; apple and cider house—all framed and in good repair; also every thing necessary for distilling brandy, convenient to a large apple orchard; there are also good log houses sufficient for the accommodation of a large family of negroes.

At the same time and place, will be offered for sale another plantation belonging to the same estate, containing [illegible] acres of land, and lying on the Otterdam Swamp about eight miles from Low Point (a public landing in the county of Surry). This place has an abundance of marl easy of access, a two story dwelling house, &c. &c.

Also at the same time and place, will be sold all the crops at the manor plantation, consisting of several hundred barrels of corn, the fodder, cotton, &c., all the stock of cows, hogs, sheep, some valuable mules, and a pair of handsome well broke carriage horses, the plantation utensils, &c.

The title to the land is indisputable. Terms for the manor plantation:—one fourth of the purchase money will be required in cash, the balance in three equal annual payments; the purchaser giving bonds and approved security, with a deed of trust on the property; for the personal property, a credit of nine months will be allowed for all sums over ten dollars, upon the purchasers giving bond and approved security; for sums of ten dollars and under, cash will be required; no property to be removed until the terms of sale are complied with.

Nov. 30th, 1839.—a11

SALT WORKS.

Those persons who are really desirous to embark in the lucrative business of Salt Making on the Florida Reef are respectfully invited to examine Duck Key where the preparatory labor have already been executed by the undisputed proprietor.

CHARLES HOWE.

Indian Key, 20 th Sept., 1839.—a2[illegible]

PRICES CURRENT—November 30, 1839.

Country Produce.

Wheat	$1 [illegible]
Flour (superfine)	$6 to $[illegible]
Corn, per bushel 58 cents,	
Cotton, - - - - - -	10 to 11 cts.
Tobacco, new, - - -	$5 25 to $8 25
Bacon, (hog round) - - - -	11 cts.

BRANCH, WINFREE & CO.

CLAIRMOUNT NURSERY,
Near Baltimore.

The subscriber has for sale on pleasing terms a large stock of the **MORUS MULTICAULIS MULBERRY TREES AND CUTTINGS**, which are warranted to be genuine, being raised by him from a stock he has been raising from for seven years. Purchasers may rely on getting a good article, and carefully packed, so as to go safely to any part of the union. The above would be sold much lower deliverable during the autumn.

Also a general assortment of all the most rare and choice grafted fruit trees, especially 20,000 **PEACH TREES** and shrub fruits. Ornamental trees and shrubs, Evergreen trees, grape vines and cuttings, succulent roots, &c. See printed and priced Catalogues, which will be sent gratis, by mail.

☞ Orders will be carefully executed by being forwarded to me by mail, or left with **DUPUY, ROSSER & JONES**, Druggists, Petersburg, Va. and **WILSON & SON**, Norfolk, Va. who act as Agents, and will receive orders at Nursery prices and furnish Catalogues as above.

ROBERT SINCLAIR, Sen.

August 29th.—4mk4s.

AGRICULTURAL BOOKS
FOR SALE AT THE
Office of the Farmers' Register.

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EDMUND RUFFIN.

April 20, 1839.

BERKSHIRE PIGS.

Farmers wishing to obtain the genuine breed of Berkshire pigs, can be supplied by applying to the subscriber near Manchester. They are from the stock imported by N. C. Bement, Esq., of Albany, in the years 1832 and 1835. Applicants will pay their postage.

L. BURFOOT.

October 12th, 1839—a4

CONDITIONS OF THE FARMERS' REGISTER.

For the EIGHTH and succeeding volumes. Prices still more reduced, for combined and punctual or advanced payments.

ART. I. The Farmers' Register is published in monthly numbers of 64 large octavo pages each, at $5 a year, payable in advance. Or, for $5 may be had *two* copies of the same current or forthcoming volume, for *new subscribers*, if so ordered and paid for in advance, (or at the time of making the subscription,) in current money, as described below, (Art. VI.) and without loss or deduction for postage, or any other charge to the publisher.

II. Subscribers who may have already paid the regular subscription price of $5 in the manner above required, for a single copy, shall have the privilege, upon sending a *post-paid* order, of having a second copy of the same volume sent to any NEW subscriber, without further charge, for that volume, if so ordered during its time of publication.

III. A like privilege will be allowed to every old subscriber who has not paid, but who shall *do so*, as above, before the issue of the 6th number of the then current volume, (at which time of all debtors' bills will be made out and sent); thus in effect REDUCING TO HALF PRICE THE COST OF THE WORK TO EVERY SUBSCRIBER, OLD OR NEW, WHO MAY CHOOSE TO AVAIL OF THE OFFER. (See also Art. V.)

IV. If, however, no more than one copy is ordered, the subscription price will still be, as heretofore, $5 the volume; as it is not designed to permit any subscription debt, or payment, to be made for less than $5. And if an order is sent for two copies, without full compliance with the conditions annexed, (in Art. VI,) only one will be sent.

V. Clubs of ten subscribers (old or new, or of both) by sending $25 (net payment) in advance and at one time, before February 1st, of each year, shall be furnished with ten copies of that volume only.

VI. The price of back volumes, as heretofore, is $5 for one alone, $10 for any three together, and in the same proportion ($3.34 cents each,) for any number of volumes short of a full set. Entire sets of 8 vols. (the 8th commencing January 31st, 1840,) will be supplied for $20, or $2.50 the volume, paid in advance, with the order.

VII. ALL MAIL PAYMENTS MUST BE MADE IN NOTES, OR CHECKS, OF PAR VALUE IN VIRGINIA, or of a CITY bank of the state in which the subscriber resides. And all letters to the editor in regard to the Farmers' Register must be post-paid—except such as contain articles for publication.

VIII. The risk of loss of payments for subscriptions sent free of postage, which have been properly committed to the mail or to the hands of a post master, is assumed by the editor.

IX. For all copies not received by mail, at the proper post offices, duplicates will be furnished to those subscribers *who have complied with their own obligations*; provided that the failure *shall be notified through the postmaster*, and *within one month after the date of the miscarried copy.*

X. If a subscription is not directed to be [illegible] and before the first number of the next volume [illegible] been published, it will be [illegible] another year. Subscriptions [illegible] beginning of some one volume, [illegible] for less than a year's publication.

XI. The mutual obligations of the [illegible] subscriber, for the year, are [illegible] the first number of the volume is [illegible] time, no discontinuance of a subscription [illegible] mitted. Nor will a subscription [illegible] any earlier notice, while any [illegible] due, unless at the option of the [illegible] to the regulations of the [illegible]

Address— [illegible]

Petersburg Va., November 1st, [illegible]

Morus Multicaulis Tre[illegible]
AND
SILK-WORM EG[illegible]

Of all kinds, in lots to suit purc[illegible] suit the times, for sale, by [illegible]

All post-paid communications [illegible]

Dec. 1.—[illegible]

AN OVERSEE[illegible]

Is wanted for the Cogge[illegible] George county) for next yea[illegible] cept such as have the [illegible] regard will be paid to any merely [illegible] recommendations.

Also, will be received on [illegible] ed, one or more boys, [illegible] 16 to 20 years old, as agri[illegible] will be employed as sub-[illegible] of some particular department [illegible] Editor of the Farmers' Regis[illegible]

EDMUND RUFF[illegible]

Oct. 31. (P. O. Garysville [illegible]

VOL. I. OF FARMERS' [illegible]

The reprinting of Vol. I. of F[illegible] completed that copies will [illegible] delivery. Those persons who [illegible] and paid in advance for copies, [illegible] few days.

Oct. 31.

TERMS OF ADVERTISING [illegible] FARMERS' REGIS[illegible]

For the space of 20 lines of [illegible] square,) $1 for the first insertion [illegible] continuance—*to be paid for in* [illegible] for printing the advertisement. [illegible] charged for advertisements in the " [illegible] issued monthly from the same office.

BOOK AND
JOB PRINTIN[illegible]
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H Nutt

THE

FARMERS' REGISTER,

A MONTHLY PUBLICATION,

Devoted to the Improvement of the Practice

AND

SUPPORT OF THE INTERESTS OF AGRICULTURE.

EDMUND RUFFIN, EDITOR AND PROPRIETOR.

Vol. VII. DECEMBER 31, 1839. No. 12.

And he gave it for his opinion, "that whoever could make two ears of corn, or two blades of grass, to grow upon a spot of ground where only one grew before, would deserve better of mankind, and do more essential service to his country, than the whole race of politicians put together."
Swift.

PETERSBURG, VA.
PUBLISHED BY THE PROPRIETOR,
1839.

(This publication consists of four sheets—postage for 100 miles or less, 6 cents—over 100 miles 10 cents.)

You owe $ for subscription, to end of this volume.

LIST OF PAYMENTS FOR THE FARMERS' REGISTER, MADE BY SUBSCRIBERS, OR PURCHASERS, FROM [illegible] 1st, TO DEC. 21st, 1839.

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Sinclair & Moore	Baltimore, Md.

PAYMENTS FOR VOL. IV.

Sinclair & Moore	Baltimore, Md.

PAYMENTS FOR VOL. V.

Sinclair & Moore	Baltimore, Md.

PAYMENTS FOR VOL. VI.

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Sinclair & Moore	Baltimore, Md.

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PIANOS.

Why go to [illegible] to purchase a Piano, when you can do as well [illegible] in Petersburg, Va.?

The subscriber believes that it is [illegible] persons [illegible] better to purchase their Pianos in Petersburg than [illegible] to New York for them. [illegible] I keep constantly on hand from fifteen to twenty well selected and [illegible] instruments, and [illegible] in Norfolk, Richmond, Baltimore, Philadelphia or New York, will be found at one time more than that quantity—so that as far as assortment goes, [illegible] not the greater inducement; and as regards prices, it will be found, by reference to several letters which were published from gentlemen who are in the habit of visiting the North twice a year, that I have sold them about as good terms as they were offered elsewhere; in fact, I believe that a great many persons pay a great deal more at the North for a really indifferent instrument, than they would for a better piano [illegible]. [illegible] the same advantage in buying a single instrument that others have who purchase fifty or more a year, [illegible] the very finest instruments [illegible]. Besides [illegible] those who purchase Pianos here, have not half the trouble and risk that they would be [illegible] purchasing at the North. If an individual purchases a Piano of me, and [illegible], I am pleased to say that [illegible] I have sold nearly one hundred and fifty Pianos [illegible] exchange or take back. [illegible]

Those who want really fine Pianos shall not be disappointed, if they trust me with their orders, either to make choice myself for them, or [illegible].

[illegible]

Piano and Music Store under [illegible], Petersburg, Va.

Oct. 29—tf

BERKSHIRE PIGS.

Farmers wishing to obtain the genuine breed of Berkshire pigs can be supplied by applying to the subscriber near Manchester. They are from the stock imported by [illegible], Esq. of Albany, in the years 1832 and 1836. Applications will [illegible] post age. [illegible]

October 12th, 1839—tf

PRICES CURRENT—[illegible], 1839.

Country Produce.

Wheat	[illegible]
Flour (superfine)	[illegible]
Corn, per bushel 52 cents.	
Cotton,	[illegible]
Tobacco, new,	[illegible]
Fresh pork,	[illegible]

BRANCH, WINFREE & CO.

THE FARMERS' REGISTER.

Vol. VII. DECEMBER 31, 1839. No. 12.

EDMUND RUFFIN, EDITOR AND PROPRIETOR.

DISEASES PECULIAR TO CATTLE. REMEDIES.

To the Editor of the Farmers' Register.

Mobile, Nov. 4th, 1839.

Dear Sir—In answer to your call for information, touching the diseases of cattle, following the communication of W. I. Dupuy; permit me to refer him and any others that may desire such information, to a treatise on cattle, written by W. Youatt, of London. The title page of the book is as follows: "Library of Useful Knowledge. Cattle, their breeds, management and diseases; with an index. Published under the superintendence of the Society for the Diffusion of Useful Knowledge. Philadelphia: Grigg and Elliott, 9 North Fourth Street, 1836." The title page is also embellished with a wood cut of the head of Firby, Lord Althorp's bull. I have been informed that a treatise on the horse, by the same author, has been republished in this country by the same publishers, as the one on cattle above referred to, but of this, I cannot speak positively, as I have not been able to obtain it. I have the treatise on cattle, and I have not a doubt that it is the best on that subject in the English language. It contains a fund of knowledge highly valuable to agriculturists, and to all such as take any interest in cattle. Mr. Dupuy remarks upon the diversity of opinion that prevails as to the nature and causes of the disease of which he is speaking. I am satisfied that the disease is *bilious fever* in its ordinary form; and when it assumes the character of an epidemic; attacking whole herds, it then answers to the more malignant forms of that disease, as the congestive fever and the yellow fever. The nature of the disease being understood, the causes that produce it may be the more readily perceived, and the remedies more appropriately employed. The causes are various, as are those that produce that disease in the human being, and act with greater force on cattle than man. Cattle are more limited in the kinds of food they take, they are more complicated in their digestive organs, less adapted to change of climate, and indeed change of any kind, they are of delicate constitution, and are consequently acted on with more force by causes that would disturb health, than man would be. Exposure to dry hot weather or hot wet weather, bad water, bad food, rich stimulating food, especially when the animal is fat and plethoric, a change of habit, consequent on a change of location and management; each of these and a hundred other causes might in their turn be rightly assigned as the proximate cause of the disease, so that it is not to be wondered at, that there are diverse opinions as to the cause. I have had several *post mortem* examinations of cattle that died with it, and found the liver enlarged, and the system generally suffused with bile, particularly about the region of the kidneys, they having a tendency to inflamation. I found the "manifold" in a greater or less degree of constipation, and the smaller intestines generally empty. These latter symptoms, the state of the kidneys, &c., are effects from the fever. I have learned too, from some intelligent butchers, that the enlargement of the liver and the general bilious symptoms are observable in very many of the western cattle that they kill, though there be no external indications of ill health; and as the warm weather approaches, they kill them off as fast as possible, knowing the risk they run by attempting to keep them.

The remedy is blood-letting, purging and dieting. Bleeding must be employed only in the early stages of the disease, and then largely—from one to two gallons, and more may be safely taken, according as the strength of the animal and the state of the pulse may indicate. The purging must be employed at all stages, till the constipation is overcome, and a free passage established. Be not deceived here, one symptom of the disease is a lax state of the bowels, and a frequent effort to void the feces while the "maniplies" is yet in a state of constipation. This accounts for the empty state of the smaller intestines that I alluded to above. One pound to one and a half of Epsom salts, dissolved in a little over its own weight of warm water, is a dose for a grown animal, and may be repeated in half pound doses every four hours, till it operates. I have given a quart bottle of castor, linseed, or sweet oil, as I had them convenient, at a dose, and continued with salts till they operated. But prevention is better than cure; then take care to know what were the habits and management and food of the animal previously, and depart as little from them as possible; keep it out of the hot sun, and if it goes out to graze only let it go in the cool of the day for a short time; let it have plenty of pure water, give it salt frequently and give it a moderate supply of food; aim not at keeping it fat, but only in living order. It were even better to be thin so it keep healthy, until it get acclimated. See that it ruminates, that it sweats at the nose, that the *feces* become not hard, dark and glazed, nor thin and in diminished quantities. Check the beginnings of evil by a timely dose of medicine.

My experience is, that all cattle, whether they come from the north or west, or from Europe, are equally subject to the disease; and those only survive that are treated with the strictest attention to their food, their drink, and the avoidance of exposure to the sun in grazing at large. Cows are more subject to sickness than bulls, the safest and cheapest way of improving a stock is by breeding on the native cows with imported bulls. But I designed to refer to a written treatise, instead of writing one. Respectfully,

Geo. E. Holt.

[We have long possessed the English edition of both the works referred to in the foregoing communication, and from one of them on "The Horse," made large extracts for republication in the Farmers' Register. They both are excellent treatises; and from the reputation of Mr. Youatt, the author, we have no doubt but that the portion of the treatise on "The anatomical structure and diseases of cattle," is the best extant on that subject. But its arrangement is too scientific to suit ordinary readers, though it is therefore the best for those who desire to study the diseases of cattle systematically and thoroughly. On account of its regular order, the part on diseases cannot well be extracted from; each account of a disease and its remedy depending so much on the more general preceding parts. The whole ought to be given, if at all, together and in connexion; and this we would have done before this, but for the fear that so much on that subject would not be acceptable to our readers in general.—Ed. F. R.]

THE LONDON CATTLE MARKETS.

From Youatt's Treatise on Cattle.

When Smithfield was first appointed as the site of the periodical market for cattle, no better situation could possibly have been selected. It was without the walls of the city, it was a large uninclosed space, and would have held ten times the cattle that were sent there. There was plenty of room for them without their being cruelly packed together, and there was no inconvenience nor danger from driving them though the streets. In process of time, however, the field was encroached upon, and partly built over; and barely room was left for the accommodation of half the present number of cattle, and those of only half the size of the improved breeds. A dense population began to surround the field on every side, and it was necessary for the cattle to pass through the most crowded thoroughfares. Thence arose danger to human life, and many an act of cruelty to the poor beast; and not only so, but the most barborous expedients were resorted to to pack the cattle in the circumscribed space which was now left to them—barbarities which it would not be thought could be practised in a Christian country, if they were not authenticated beyond all doubt. We subjoin one statement of them; it deserves the attentive perusal of every one connected with cattle, and, we trust, will lessen the virulence with which some, more from an erroneous calculation of interest, than from an actual want of human feeling, oppose the removal of the cattle-market once more to the outskirts of the city, and the establishment of abattoirs or slaughter-houses there.

"In Smithfield market there is not room to tie up to the rails much more than half of the cattle sent there for sale! The remainder are disposed of by being formed, in groups of about twenty in each, into 'rings' or 'off-droves,' as such divisions are termed. About two o'clock in the morning the Smithfield barbarities are at the height, and the constables, being sent into the market in the daytime only, are consequently not in attendance. The drovers surround the unfortunate bullocks which cannot be tied up in the market, and commence by aiming with their bludgeons blows at their heads, to avoid which they endeavor to hide their heads, by keeping them towards the ground. On attempting to run backwards, the bullocks are restrained by blows upon their hocks and legs, together with the application of goads; whilst, if they venture to lift up the head, a dozen bludgeons are instantly hammering on it, until again lowered to the ground. This scene of barbarity is continued until every bullock, howevery refractory, obstinate, stupid, or dangerous at first, has been disciplined to stand quietly in a ring—their heads in the centre, their bodies diverging outward like the radii of a circle: this is done that they may conveniently be handled by the butchers. The barbarity of Smithfield is at its height during the night; but in the day time, by seeing the process by which one or more bullocks, when sold, are driven out of a 'ring' or 'off-drove'—and observing the hammerings with bludgeons on the head; the thrusting the goads into the nostrils of the animals to make them move backwards, after similar instruments had been applied to urge them in the contrary direction; by witnessing the mode of re-forming the 'rings' or 'off-droves,' which are constantly broken through by the withdrawment of purchased animals, as well as by the passing and repassing of carts and drays, some faint idea may be formed of the amount of needless barbarbarity inflicted, and of the consequent deterioration of the meat. The deterioration of the meat has been calculated at no less a sum than 100,000l. per annum, notwithstanding the care which the drovers take to strike chiefly where there is no flesh interposed between the skin and the bone: where the animal feels most acutely, but there is no black mark to tell tales. 'I have lived fourteen years in Smithfield,' said a very intelligent witness, 'and I find it perfectly impossible to sleep in the front of my house on the Sunday night. The cruelty practised upon the cattle, in beating them into the 'rings,' no person can believe who has not seen it; and, as it is a matter very easily to be seen, I hope some of the committee (now sitting) will see it personally. Supposing a salesman to have twenty beasts (which could not be tied up), he will have them all with their heads in and their tails out; they form a ring; and in order to discipline them to stand in that manner, the drovers are obliged to goad them behind and knock them upon the noses. They strike them with great force upon the nose, and goad them cruelly behind, by which means they form themselves into 'a ring;' so that, at the period I speak of, there is a great deal of unnecessary cruelty. At length the cattle will stand in that manner, so perfectly disciplined, that, at breakfast-time, there shall be twenty or thirty 'rings' of this kind standing in the middle of the market. If the 'ring' is broken by any means, they are all in the greatest anxiety to get in again; and when the drovers are obliged to separate these 'rings' and drive the cattle away, they have a great deal of trouble, and the labor of the men is excessive to get one single beast out. Indeed, if you can conceive first getting the cattle into 'a ring,' as I have stated, and if one is sold out of the ring at eleven in the day, the beast is ordered to be driven through fifteen hundred cattle, whichever way he goes out of the market, and the man is goading that beast all the way—if you can conceive men compelled to exercise this cruelty, they will not be very delicate of the manner in which they use it after a time!'

"Another witness, who had been 'a salesman about eight years,' thus described the scene:—

"'I have stood behind eight of these off-droves and the cruelty which is necessarily exercised to get them to stand properly is very great indeed, and which, by tying up, might be totally removed, and is the cause of the great complaint which exists of the bruised and the wildness of the different animals when passing through the streets. I will describe simply the manner in which it arises. Perhaps more than an hour's violence has been exercised towards the cattle, to get them to stand about twenty in each circle—and during the whole of this time they are beaten, now about the hocks, and then about the head. If the head turns outward, they are beaten about the head till they are turned inward. The great cause of the inhumanity described arises from this circumstance, that when a bullock is driven, perhaps from the centre of the market, by the butchers' drovers, that bullock will run into five, six, seven, eight, or nine of the droves before he gets out of the market: perhaps in every one of the droves that bullock is beat upon the head for ten minutes before he can be got out of it again, and then he runs to another drove, from the circumstance of having been so beat about in the early part of the morning. Consequently, perhaps, this bullock is beat out of ten droves before he gets out of the market, to the very great injury of the animal. He is often beaten nearly or quite blind ; and when it gets into the public streets, the bullock, irritated by the violence committed, scarcely conscious where he is, runs at any thing, or over every thing, or through every thing. All this would be entirely prevented, if there were room to tie each bullock separately up.' "

We subjoin, in connexion with this, an account of an undertaking of an opulent and benevolent individual, Mr. Perkins, who, at the expense of 100,000*l.*, has erected a cattle-market, in the Lower Road at Islington, which will contain double the number of cattle usually exhibited in Smithfield, and render the cruelties there practised in the packing of them, no longer necessary. The building, so far as it has proceeded, was first thrown open to the inspection of the public, on the 13th of Sept., 1833.

" The new mart stands upon an area of 22 acres, immediately abutting upon the Lower Road, Islington. The situation is airy and healthy, and is peculiarly appropriate for the purpose, as it is on the high road for the northern and eastern parts of the country, whence the principal supply of cattle for the London market comes. An immense square is enclosed by high walls, around which are erected a continuous range of slated sheds, supported by 244 Doric pillars, under which the cattle may at all times be protected from the severity of the weather. These sheds are subdivided into numerous compartments, with lairs enclosed by oak paling in front, to which the beasts may be either fastened, or allowed to be at liberty, so as to be conveniently subject to the examination of the purchasers. In each lair their is a water-trough, constantly supplied with fresh water, by means of pipes passing underground, from two immense tanks, which are kept filled by machinery from capacious wells which have been sunk for the purpose. The average length of the sheds is 830 feet, and they are capable of accommodating at least 4,000 beasts, and here they may remain from one market-day to another, or till such times as it may be convenient for the purchasers to remove them—an advantage wholly impracticable at Smithfield.

"The open space in the centre is divided into four quadrangles, intersected by wide passages, and in these quadrangles are to be erected sheep-pens (the materials for which are all ready), capable of holding 40,000, so placed as to be approached with perfect facility. Other pens are constructed for calves, pigs, and such animals as are usually brought for sale at the cattle-market, upon an obviously simple classification, so as to avoid confusion or irregularity of any sort.

" Every necessary office for salesmen and clerks of the market will be erected in a large area in the centre, and the ingress is obtained through a large arched passage under the market-house, a fine substantial building, with appropriate offices on each side for check-clerks, and with accommodation up stairs, either for the counting-houses of bankers, or public meetings connected with the business of the establishment. To the leads of this house the visitors proceeded, and from thence a full view of the whole market was obtained, as well as of the surrounding country; at once showing the perfect appropriateness and unobjectionable character of the site, which, in point of extent, is four times larger than Smithfield. The piers and layers are all to be paved, if we may use the expression, with hard bricks; and the drainage is so contrived as to ensure perfect cleanliness in the most unfavorable weather.

"*Abattoirs.*—Adjoining the market it is intended to erect abattoirs for slaughtering cattle of every description; in which persons may either be accommodated with private slaughter-houses, or have the animals slaughtered under appointed inspectors at a certain fixed and moderate rate ; so that all the expense, inconvenience, and mischief arising from the present mode of driving the cattle through the crowded streets on the market-day may be avoided.

" A market tavern, with stable-yard, stables, and sheds, capable of accommodating the horses of the frequenters of the market, is also to be erected, together with a range of shops for the sale of such things as are calculated to meet the wants of the various classes who may be drawn to the spot by their respective avocations. Every possible want has in fact been foreseen ; and, as the place is now open for inspection, the public have an opportunity of judging of its utility by personal observation."

THE LONDON DAIRIES.

From Youatt's Treatise on Cattle.

The dairies of the metropolis are objects of much interest to the stranger and to the agriculturist. In pursuit of the object of this work, we travelled over the greater part of the United Kingdom ; and although we often had no other recommendation than the simple statement of the purport of our journey, we met with very few cases of incivility or of unwillingness to give us the fullest information ; but when we returned to our usual residence, and where we expected most facility in the attainment of our object, we will not say that the refusal to admit us was accompanied by rudeness, but the gate of the dairy remained closed. This was the case with our overgrown milk establishments. It was a species of illiberality on which we had not calculated ; but it mattered little, for we had seen many of the smaller ones, and we could guess with tolerable accuracy at the difference of treatment in some points—indeed they had been already whispered to us, and we had besides a minute and accurate account of them in the Magazine of our friend Mr. Berry.

The number of cows kept for the purpose of supplying the inhabitants of the metropolis and its environs with milk is about 12,000. They are, with very few exceptions, of the short-horn breed —the Holderness or Yorkshire cow, and almost invariably with a cross of the improved Durham blood. The universal preference given to this breed by such a body of men, differing materially on many branches of the treatment of cattle, is perfectly satisfactory as to their value, and that on three distinct points.

First, as to the quantity of milk. This we need not press, for the enemies of the short-horns have never contested this point. There is no cow which pays so well for what she consumes in the quantity of milk that she returns.

This, however, is not all, though it may be the principal thing which enters into the calculation of the metropolitan dairymen.

The name of the new milk has something very pleasant about it, but it is an article which rarely makes its appearance at the breakfast or tea table of the citizen. That which is got from the cow at night is put by until the morning, and the cream skimmed off, and then a little water being added, it is sold to the public as the morning's milk. The real morning's milk is also put by and skimmed, and, being warmed a little, is sold as the evening's milk. This is the practice of most or all of the little dairymen who keep their half a dozen cows; and if this were all, and with these people it is nearly all, the public must not complain: the milk may be lowered by the warm water, but the lowering system is not carried to any great extent, for there is a pride among them that their milk shall be better than that of the merchants on a yet smaller scale, who purchase the article from the great dairies; and so it generally is. The milk goes from the yard of the great dairy into the possession of the itinerant dealers perfectly pure; what is done with it afterwards, and to what degree it is lowered and sophisticated, is known only to these retail merchants.

The proprietor of the large dairy is also a dealer in cream to a considerable extent among these people; he is also a great manufacturer of butter, for he must have milk enough to answer every demand, and that demand is exceedingly fluctuating; then it is necessary that the quality of the milk should be good, in order that he may turn the overplus to profitable account, in the form of cream or butter. The employment of the short-horn cow, in all the dairies, is a convincing proof that her milk is not so poor as some have described it to be.

It is the practice in most of the dairies to fatten a cow as soon as her milk becomes less than four quarts a day. They are rarely suffered to breed while in the dairyman's possession. The fact of their being so often changed is a proof that while the cow gives a remunerating quantity of milk for a certain time, she is rapidly and cheaply fattened for the butcher as soon as her milk is dry. Were much time or money employed in preparing her for the market, this system would not answer, and would not be so universally adopted. Fattening and milking properties can, therefore, combine in the same animal, and they do so here.

Mr. Laycock, however, does not adopt this as a general rule. The cows that are more than usually good milkers are suffered to take the bull when in season. He always keeps some good short-horn bulls for this purpose. It sometimes happens that the cow will continue to give milk until within a few weeks of calving; and he judges, and perhaps rightly, that this is a more profitable course than to fatten and get rid of her, with the probability that he might replace her by a cow that would give a less quantity of milk.

The present market-price of a good dairy cow is about 20*l*., but the owners of the small dairies have no little trouble to get a good cow. The jobbers know that they will have a ready market for a considerable portion of their lot in the yards of the great cow-proprietors, and will probably get a larger price than the poorer man would give; and therefore Messrs. Rhodes, or Laycock, or one or two others, have always the first selection. Mr. Laycock has peculiar advantages for obtaining good cattle. In addition to his dairy, he has sheds that will contain five or six thousand beasts. A great proportion of them halt on his premises for a day or two before they are brought into the market. In addition to the shilling a night which he charges for their standing, he claims the milk of the cows as his perquisite. The cows are milked by his people; he therefore knows beforehand the quantity of milk which each will yield, and he is thus enabled to cull the very best of the herd. The dairymen do not like a cow until she has had her third or fourth calf, and is five or six years old; she then yields the greatest quantity of milk, and of the best quality. Two gallons of milk per day is the quantity which each cow is expected to yield in order to be retained in the dairy. Taking one cow with another, the average quantity obtained is rather more than nine quarts.

When she begins to fail in her milk, she is fattened on oil-cake, grains, and cut clover hay, and disposed of. The dairyman calculates on getting something more for her than when he first bought her, but sometimes he meets with an animal that seems to verify the old prejudice against cows in good condition. He bought her for known milking properties, but she continues so poor that he in a manner hides her in some corner of his dairy. She, however, does her duty; she yields him plenty of milk, but that at length dries up; and he is unable, try what he will, to get much flesh upon her bones, and he sells her for less than half of her first price.

The quantity of milk yielded by all these cows, at 9 quarts per day, amounts to 39,420,000 quarts, or 27 quarts of genuine milk for each individual. The retail dealers usually sell the milk for 4*d*. per quart, after the cream is separated from it, and then obtain 3*s*. per quart for the cream; beside this, a great deal of water is mixed with this skimmed milk: so that we far underrate the price when we calculate that the genuine milk sells at 6*d*. per quart, which makes the money expended in milk in the British metropolis amount to 985,500*l*. or nearly a million pounds per annum.

If we again divide the 985,500*l*. by 12,000, (the number of cows,) we shall have the strange and almost incredible sum of more than 82*l*. as the money produced by the milk of each cow. This is divided among a variety of persons, and after all affords but a scanty subsistence to many of them; but it unequivocally proves the rascality that pervades some of the departments of the concern.

We acquit the wholesale dealers of any share in the roguery, nor do we believe that their profits are exorbitant. They sell the milk to the retail dealers at a price that, according to Dr. Middleton, would enable them to clear 64 per cent., without adulterating the article—(we believe that 50 per cent. would be nearer the truth.) When we consider the nature of the business; the distance the milk-girls have to travel; and the time wasted in selling their little quantities from door to door, this profit is not too great; but when they abstract the cream, and add the water, and, unless they are much belied, some extraneous and abominable articles, the actual profits will far exceed cent. per cent. In the spring of the year, when London is full, the consumption and the deterioration are greatest. In the latter part of the year the cream is converted into butter, and the butter-milk given to the hogs.

Rhode's dairy has been established more than thirty years, but some of the same family or name have lived in that neighborhood nearly a century. 'Mr. Rhodes, farmer, near Islington,' is referred to by Dr. Brocklesby, in his treatise on the murrain which prevailed among cattle about the middle of the last century. The writer of 'London Dairies,' in the 'British Farmer's Magazine' for February, 1831, gives a description of it, of which the following is the substance:—The surface on which the buildings are placed is a gentle slope of two or three acres, facing the east. The sheds run in the direction of the slope, as well for the drainage of the gutters as for the supply of water for drinking, which will thus run from trough to trough the whole length of the shed. The sheds are twenty-four feet wide; the side-walls being about eight feet high, with rising shutters for ventilation, and panes of glass let into iron frames for light. The floor is nearly flat, with a gutter along the centre, and a row of stalls, each seven feet and a half wide, along the sides, and adapted for two cows, which are attached by chains to a ring that runs upon an upright rod in the corner of the stalls. A trough or manger, of the ordinary size of those used for horses, is placed at the top of the stall. Four of these sheds are placed parallel and close to each other, and in the party-walls are openings a foot wide, and four feet high, opposite to each cow. The bottom of these openings is about nine inches higher than the upper surface of the troughs, and contains a one-foot square cast-iron cistern, which contains the water for drinking; each cistern serves for two cows that are placed opposite to each other, but in different sheds; all these cisterns are supplied from one large tank. These cisterns have a wooden cover, which is put on while the cows are eating their grains, to prevent their drinking at that time, and tainting the water by dropping any of the grains into it. At the upper end and at one corner of this quadruple range of sheds is the dairy, consisting of three rooms, each about twelve feet square; the outer, or measuring-room—the middle, or scalding-room, with a fire-place and a boiler—and the inner, or milk and butter room.

At the lower end of the range is a square yard surrounded by sheds, some for fattening the cows when they have ceased to give milk, and the others for store and breeding pigs. The pigs are kept to consume the casual stock of skim-milk which remains on hand, owing to the fluctuations of the demand. The milk is kept in a well, walled with brick laid in cement, about six feet in diameter, and twelve feet deep. The milk soon becomes sour there, but is then most nourishing to the hogs. Breeding swine is thought to be the most profitable, and the suckling pigs are sold for roasting.

Beyond this yard is a deep pit or pond, into which the dung is emptied. There is a stack-yard, sheds, and pits for roots, straw, and hay; a place for cutting chaff, cart-sheds, stables, and every building which such an establishment can require. The number of cows varies from four to five hundred.

The treatment of the cows is singular in some respects. The cows are never untied while they are retained as milkers. Some of them have stood in the stall more than two years. Mr. Laycock, on the contrary, turns his cows out once every day to drink from troughs in the yard, and they remain out from half an hour to three hours, depending on the weather and the season of the year. From the end of June until Michaelmas, they are turned into the fields from six o'clock in the morning until twelve or one, and from two o'clock in the afternoon till about three o'clock on the following morning. Mr. Rhodes's cows have always water standing in the cisterns before them.

We can readily conceive that, from the want of exercise, and consequent cutaneous perspiration, Rhodes's cows may give a somewhat greater quantity of milk than Laycock's; but on the other hand, when we think of an animal tied in the corner of a stall for twelve, or eighteen, or twenty-four months together, we cannot help associating the idea of disease, or tendency to disease at least, with such an unnatural state of things; the feet and the digestive system would particularly suffer, and we should suspect a little vitiation of all the secretions, and some deterioration in the quality of the milk. We should like to know the comparative state of health of the animals in the two establishments. The inclination of our opinion would be strongly in favor of Mr. Laycock's plan.

The principal food of the cows in both of these, and in all the dairies of the metropolis, is grains; and as the brewing seasons are chiefly in autumn and spring, a stock of grains is generally laid in at those seasons for the rest of the year. The grains are laid up in pits, lined with brick-work set in cement, from ten to twenty feet deep, and of any convenient size. They are firmly trodden down, and covered with a layer of moist earth, eight or nine inches thick, to keep out the rain and frost in winter, and the heat in summer. A cow consumes about a bushel of these grains daily, the cost of which is from fourpence to fivepence, exclusive of carriage and preservation. The grains are, if possible, thrown into the pit while warm and in a state of fermentation, and they soon turn sour, but they are not liked the worse by cattle on that account; and the air being perfectly excluded, the fermentation cannot run on to putrefaction. The dairymen say that the slow and slight degree of fermentation which goes on, tends to the greater developement of the saccharine and nutritive principle, and they will have as large a stock upon hand as they can afford, and not open the pits until they are compelled. It is not uncommon for two years to pass before a pit of grains is touched; and it is said that some have lain nine years, and been perfectly good at the expiration of that period. The dairyman, however, must know his brewer, and be able to depend on him. The grains from a large ale brewery are the most nourishing. Those from the porter brewery are not so good; and those from the little brewers, who first draw off their ale, and afterwards extract every particle of nutriment in the formation of table beer, are scarcely worth having.

Each cow is allowed a portion of salt. In Rhodes's establishment it is given with the grains. Laycock salts his rick when it is first made—a most excellent plan, for the hay is not only effectually secured from becoming mow-burnt or mouldy, but it is rendered more grateful to the animal, and we may venture to say, almost doubly nourishing, from the developement of the saccharine principle. It is to be doubted, however, whether the cows obtain a sufficent quantity of salt in this way. Some should be given with the grains.

The grains are usually given about three o'clock in the morning, and two o'clock in the afternoon, being a little before the usual milking hours. Between the milkings they have green meat, as long as the season will permit. Cut-grass is a favorite and excellent food; but where it can be managed, the plan of Mr. Laycock to let the cows cut the grass for themselves is a far superior one. Tares come in before the grass, and are afterwards given alternately with it. In winter, turnips, potatoes, and mangel-wurtzel, are given as long as they can be obtained at any reasonable price; and then the dairyman is driven to hay or chaff: the superiority of chaff is now generally allowed.

Both of these gentlemen fatten off their dry cows with grains, oil-cake, and clover chaff, to which Mr. Laycock adds boiled linseed. Our readers may recollect the experiments made by the Duke of Bedford on the fattening quality of linseed, boiled and unboiled, and in which the simple unboiled linseed fattened the animals more expeditiously than any cooked preparation of that seed. Mr. Laycock boils the linseed in a common boiler, and when reduced to a pulp, conveys it by tubes into large wooden cisterns, where it is mixed with clover chaff roughly cut, and sometimes with grains.

These wholesale dairymen usually agree with the retail dealers, that they (the dealers) shall milk the cows. The dealer knows the quantity of milk that he wants, and the dairyman knowing the usual quantity of milk yielded by each cow, calculates what number of cows will meet the demand, and the retail dealer attends at three o'clock in the morning and two in the afternoon, to milk these cows. He carries it into the measuring-room, where its precise quantity is ascertained. If, as cows often vary considerably in their flow of milk in the course of two or three days, he has milked more than his quantity, it is put into a vessel belonging to the dairyman; or if the cows should not have given their usual supply, the deficiency is made up from the dairyman's vessel. The milk which is left on hand is put into shallow vessels, the cream skimmed and made into butter, and the skimmed-milk thrown into the pit for the hogs.

The joint-stock dairies, which a few years ago sprung up in such abundance, have either ceased to exist, or the number of cows, much diminished, have fallen into private hands. While there were many partners, and the business was controlled by a committee of persons who knew nothing at all about the matter, they all proved to be lamentable failures. Some of them, even in the hands of private individuals, who brought with them little or no experience, were sadly ruinous concerns. The Metropolitan dairy was a striking illustration of this; but now, under the management of those who have been drilled into the business, it is doing better.

THE INCREASE OF INSECTS CAUSED BY THE NON-GRAZING SYSTEM.

To the Editor of the Farmers' Register.

Shirley, November 20, 1839.

I have been thinking for some time of writing something on the subject of the great increase of insects in our country, and particularly where the non-grazing system has been pursued for any length of time, as it has been with me in the four-shift system. I am now convinced that no system will answer in our warm climate without tolerably close grazing. The insects become so numerous, that unless you have the most favorable seasons, your crops are very seriously injured by them. I believe that if we could always have favorable seasons, that is to say, if in the spring and fall we could have mild, moist weather, with frequent rains during summer, so as to give the crops a good start, and keep them growing, our crops, under the four-field system on good land, would bid defiance to insects, such is the increased fertility produced by the system. But our springs and falls are so frequently cold and dry, and summers subject to great droughts, that the crops are checked, and then the insects destroy them, or injure them very seriously, on the very best land.* I was always under the impression that partial grazing was necessary for success in cropping, but I was not aware until lately, that it required so much, and such close grazing in our country, to keep under insects; and with close grazing the four-field system will not answer, for the success of it depends entirely on a good clover lay for fallow, once in four years, both to give, and keep up the fertility of the land.

I am confident under the four-field system pursued by me for 20 years past, my land has increased four-fold in fertility; but in consequence of the non-grazing, or very partial grazing, the insects have multiplied an hundred-fold, or perhaps I might justly say one thousand-fold; and so numerous have they become, that I find my crops on highly improved land have become very precarious in consequence; therefore I have determined to change my system to one which will allow of close grazing; and I do not know of any one which will answer so well as a five-field rotation, which I mean therefore to adopt. As a proof of the fertilizing power of the four-field system pursued by me, I will mention that I have for many years past turned under heavy lays of clover, and weeds, on land that 20 years ago would not yield clover at all, so reduced was it by bad cultivation; but notwithstanding the fine clover lays, the crops, if the season should be a bad one, are not as good as they ought to be, in consequence of the depredations of insects, and I must reluctantly abandon my favorite system. I find that the marled and limed lands are much less subject to injury from insects; but grazing is nevertheless indispensable to get rid of them, and I fear it will require very rigid grazing.

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* Insects do very little injury in favorable seasons, because there is then sap enough to feed the insects and make the crop, but we much more frequently have dry and bad seasons, and then the insects do great injury.

My wheat was sown this fall on a very fine fallow of clover, part of it highly manured, and part marled, and I had a right to calculate on a very heavy crop; but the clover worm has committed sad havock already, and must lessen the crop very materially. I propose converting my standing pasture into a fifth field, and grazing the field to be fallowed, very closely, every fifth year. That is to say, I shall let the land remain two years in clover; the first year not to be grazed at all, as an improver, but the second year to be closely grazed, and then fallowed for wheat, then followed by corn, then by wheat again, and then laid down in clover to remain two years, &c., as before, viz., clover, clover-pasture, fallow-wheat, corn, wheat. This system has the objection of three grain crops in succession, but no system is entirely free from objections, and it has been practised in many parts of our country with great success for some time, and I am told is not very liable to insects, which is the great evil with me now.

I have thought it necessary to write this to warn those who may have adopted the four-field system with standing pasture and non-grazing, or very partial grazing, which I recommended in several communications to the Farmers' Register. There is no doubt that the above four-field system will increase the vegetable matter in the land most rapidly; but the increase of insects caused by increase of vegetable matter in our hot climate, will do away the benefit of increased fertility in a very great degree without close grazing, or some other means of getting rid of them.

Yours most respectfully,
HILL CARTER.

LETTERS FROM A YOUNG FARMER TO MR. JAMIESON.

Class III.

(Concluded from page, 678.)

From the Edinburgh Farmer's Magazine.

August 5.—I am favoured, my dear Sir, with your obliging letter of 2d instant, which adds to the numerous obligations already conferred upon me. You hint the propriety of seeking after a regular housekeeper, now when I am fairly settled in the farm; and forcibly urge the manifest advantages of the matrimonial state to every man possessed of a house, and capable of supporting a wife and family in a suitable manner. Though I have not the slightest cause of dissatisfaction with my sister, who enters into all my views with spirit and alacrity, yet it must be confessed, that I have some thoughts of giving her an opportunity of returning to my father and mother. As you justly observe, no woman whatsoever can manage a man's household affairs with the like frugality as she with whom he is legally connected for life. When called from home, he can with confidence reflect that his house is under the management of one who is equally interested with himself in its prosperity; and he may be satisfied, that though all the rest of mankind forget him, there is still one individual who thinks of him with pleasure, and looks for his return with heartfelt anxiety. You also remark, that many unmarried farmers have been plundered by those to whom their household affairs were entrusted; and quote several instances, some of which are not unknown to me, of persons so circumstanced being thereby brought to the gates of ruin. Your advices have therefore made a deep impression, and probably may occasion a disclosure of my sentiments at an earlier period than once intended. I refrain from saying more at this time on such an important subject, fondly hoping, when my sentiments are disclosed, that they will not be disagreeable to you.

I mentioned, in my last, that the fallow field of thin clay soil was dunged and seed-furrowed for wheat; and can now acquaint you, that the whole fallows have received dung, and that we are busily engaged in ploughing it down, an operation undoubtedly of great importance. The dung, as measured in June last, when the arbiters settled matters betwixt my predecessor and me, was reported to consist of 960 cubic yards, which, according to the common understanding, ought to have loaded 640 double carts. I found, however, that it was taken out by 548 carts, which was nearly at the rate of one cubic yard and three quarters per cart. As fifty cart-loads of decent dung were made by soiling through the summer, the quantity applied to the turnip and fallow land appears to be nearly twelve carts per acre on an average. The greatest part of the dung, however, was so well rotted, that my father assures me the land is sufficiently manured. He seem hostile to an overdoze alleging, that such is as detrimental to the soil as a surfeit of food is to the human body. I took particular care to have it well spread, having learned, when under your inspection, the great benefit arising from separating the parts in the most minute manner.

As the dwelling-house needed some repairs, I have lately gutted a part of it, and made a new room, twenty feet by sixteen, which will enable me to receive my friends, with comfort to them, and satisfaction to myself. When you come over, we will *heat* the new room, at which time my father promises to see me. You and he have been so intimate for such a length of time, that a meeting cannot fail on both sides to be highly agreeable.

August 30.—The crops on this farm are not amiss; and a part of the wheat is already cut. My predecessor has taken a house in the neighborhood, so as he may be at hand to superintend his harvest-work; and, having an overseer to look after the reapers, is not by any means confined to the field. The cutting is not so good as I could wish; there being, in my opinion, not less than fifty stones of straw left upon each acre of wheat, which, of course, will lessen the quantity of the dung on the farm next year considerably. I have heard it remarked, that fifty stones of straw will make two cubic yards of dung, if properly manufactured; so the loss, by this high cutting, will not be a trifling one. Many proprietors are careful that the land, in the last year of the lease, should be cropped in a regular manner; and so far they are in the right:—but none of them, to my knowledge, have ever prescribed any regulation, or interfered in the slightest manner concerning the cutting of that crop, though a great and serious injury may evidently be sustained by the new tenant, when the crop is cut in a slovenly or imperfect manner. I spoke to my predecessor on that subject; but his reply was, that his interest went no further than cutting the whole corn, and, so far, he would take care of the reaping; but, as for cutting by the ground, which would add five shillings per acre to the expense, that was no part of his business. As matters stand, I believe he is in the right; therefore think, without a special clause in leases, such an abuse stands a chance of being continued, notwithstanding of its injurious consequences to the cause of agriculture.

The fallow fields being all seed-furrowed, I have set the carts to driving lime for one of the clover fields, and expect to finish it before seed-work commences. I am still giving the horses one feed, or six avoirdupois pounds, of oats per day, finding it impracticable to carry on work in a business-like manner without that assistance. Since my entry at Whitsunday, the ten working horses have consumed forty-eight bolls of oats. The first five weeks, they were fed three times a day; the next four weeks, twice a day; and afterwards received only one feed. I paid, on an average, twenty-seven shillings per boll for the oats, which amounted to sixty-four pounds sixteen-shillings. This, to be sure, is a heavy charge; but, without bearing it, I must either have run down my stock, or executed the summer-work of the farm imperfectly. Under this expenditure, I have turnipped and summer-fallowed fifty acres of land in a satisfactory manner, besides driving a considerable quantity of lime; therefore, do not grudge the expense which has been incurred.

The grass land did very well, having been saved till a full bite was obtained. This mode of management is undoubtedly most commendable,—serving to cover the surface, and thereby to benefit the soil, whilst, at the same time, it is the alone best way of bringing forward the bestial thereupon depastured. The ten highland cattle received from my father are already sold; and the country beasts purchased at the markets are in a thriving condition. I have thoughts of disposing of them to some of the turnip feeders, considering that my twelve acres of turnips and ruta-baga will be better appropriated to the support of winter ewes and cattle, then to the feeding of these beasts. I purchased, at different times, a score of country cattle; and suppose, at Michaelmas, that, one with another, they may yield a profit of three pounds per head, having constantly had a full supply of food.

Till last week, I had not the slightest dispute with any of the servants; but an altercation then ensued, which required a strong measure to be used without delay. One of the ploughmen, whose physiognomy displayed evidence of a sulky temper, was beating his horses with the plough-staff when I came upon the field. He desisted from such barbarous usage upon getting a sight of me; but, being resolved to check the first appearance of a practice which cannot be too severely censured, I went up to him, and calmly inquired why he presumed to beat my horses in that manner? He insolently replied, that he would thrash any man's horses, even those of the King himself, were they not obedient to his orders. Will you do so my good fellow? Then I must tell you, that you are not to remain in my service a moment longer. Unyoke the horses, and take them to the stable. That I will says he; but I hope you will pay me my wages. Yes, for the time you have served me, provided you instantly leave the place, with bag and baggage. I gave the horses to one of the labourers for a day or two, till another ploughman was engaged; and I am almost certain, that the example made will be attended with beneficial consequences, as the fellow hitherto has not procured any employment. Indeed, when the purchase and keep of horses is so great, no man whatsoever ought to receive employment as a ploughman who uses these animals in an improper manner.

September 12.—The fallowed field of thin clay soil, containing fourteen Scotish acres, was sown a few days ago with ten bolls of excellent wheat, purchased, according to your recommendation, from the celebrated Mr. Hunter,—a gentleman who, perhaps, has paid more attention to the breeding of seed-wheat than any other agriculturist in the Island. The pickling process, upon which, you always told me, much depended, was conducted with the greatest attention. I previously provided a considerable quantity of stale urine, and hot limeshells fresh from the kiln. After wetting the grain completely with the urine, we riddled so much newly slaked lime upon it as to dry up the moisture. Then, turning the heap, and mixing the whole sufficiently, the grain was put into two carts and carried to the field, where it was sown with the utmost expedition. We entered early in the morning to work, and finished the field without unyoking the horses. The fourteen acres took twelve hours work of ten horses to give a double time of the harrows in length, a double time across, and a single time in length as a finisher. The field was also water-furrowed before we left it; and I fed both men and horses upon the ground, otherwise it would have been impracticable to have got through more than two thirds of the work which was executed. Next day, the whole headland and *gaw*-furrows were spaded and shovelled; and it was well that these operations were speedily performed, as, yesterday, a great deal of rain fell, and put the ground into such a condition, that I suppose neither ploughs nor harrows can be yoked for several days.

My predecessor had got up six stacks of wheat and two of potatoe oats before the rain fell; but when he will get more into the yard, is a problematical circumstance. I gave him two days of my carts, and am resolved to assist him, so far as in my power, till the whole crop is harvested. None of the stacks were covered when the rain arrived, though he immediately set about that necessary operation, which, to say no more, can never be well executed, except when the weather is calm and dry. A waygoing tenant is certainly exposed to many inconveniences when harvesting his last crop. He is rarely on the spot himself, and seldom provided with the best set of hands for performing the several branches of harvest work, To cover a stack in a neat and sufficient manner, requires a servant of more than ordinary abilities; and it is hardly to be expected that such will be found amongst the common tribe of harvest workers. In short, the evil can only be remedied by stipulating, in the lease, that the waygoing crop is to be taken at a fair valuation by the landlord, who, of course, when he sets the farm, will transfer the obligation to the incoming tenant.

Here, I am aware, it may be objected, that a burden would be thrown upon the landlord, or the person who stood in his shoes, and that the advantage would be entirely on the side of the waygoing tenant. To this, it may be answered, that neither loss on the one side, nor advantage on the other, could possibly happen, were such valuations conducted upon proper principles. Hitherto, to take corn upon valuation, has constantly been not only a troublesome, but also a losing business. These circumstances entirely proceeded from no allowance being ever made for trouble and risk, and very often from valuing a whole crop at the average fiars—a rate of price never obtained on the best of farms. It is plain, that the man who undertakes the trouble of managing the harvest operations of a farm, is entitled to an allowance on that account, and likewise to a certain *per centage* for risk, &c. otherwise he must necessarily be a loser when the business is winded up. Notwithstanding, it is quite fair that such allowances should be made, I never heard of the slightest notice being taken of them when a corn crop was valued. The arbiters value the whole crop upon the ground, and, when the straw is not steelbow, usually allow it for the expenses of harvesting, thrashing, and marketing; which allowance is certainly far below the mark, when the enormous trouble of harvesting a crop, and the risks run before it is converted into money, are fairly considered; but even in instances where harvesting, thrashing, and marketing, have been suitably estimated, the smallest allowance has not been granted for trouble and risk, though, perhaps, the farmer, who, in these respects, occupies the shoes of another person, would not be overpaid were ten shillings *per* acre decerned to him on these accounts.

I have got in six score of ewes for wintering upon the farm. They are got at this early period with a view of putting them in good condition before the tups are admitted; and this, it is proposed, shall not take place sooner than five weeks from this date, so as lambs may be obtained about the end of March. These ewes are of a mixed breed —a dash of the Northumberland with the Cheviot; and promise, with Leicester tups, to produce lambs of good size and quality for the butcher. I am giving them a clover stubble at this time, and intend to allow a wider range afterwards. Very probably they will be removed into one of the old pasture fields about the end of January, when the clover stubbles are ploughed, where they will receive turnips, and remain till the lambing season. I mean then to give them young grass, as being the alone best method of feeding good lambs, though very likely turnips and ruta baga may be continued so long as these crops are unconsumed, there being no other way of making the young grasses carry on a stock in April and May, adequate to what they are capable of supporting through the summer season. My father strenuously recommends the ewe and lamb trade to me; and maintains, that no other mode of consuming grass can pay the farmer so handsomely, so long as existing circumstances continue.

October 6.—The wet weather mentioned in my last continued for eight days, and occasioned a considerable expense to my predecessor, who had sixty or seventy people to maintain, without obtaining any work of the slightest consequence from them. Repeatedly, betwixt showers, the reapers were taken to the field, and as often returned, after perhaps working for an hour, and being drenched to the skin; which, of course, was a double loss to him. He took considerable care to keep the cut corn upon its foot, which undoubtedly was an useful measure. I observe some of it, however, to be sprouted, especially the head sheaves; indeed, no care can prevent a circumstance of that kind from occurring, when such a length of adverse weather prevails. The weather settled about the twentieth of the month, when some fine equinoctial gales came on. A day or two passed before any thing could be done with the cut corn; but the moment it was dried externally, my predecessor set his whole reapers to opening the sheaves, and very soon got a considerable quantity ready for the stack. As all my carts were at his command, the fields were soon cleared; and the weather continuing good, the remainder of his crop was afterwards cut, and in due time safely deposited in the stack-yard.

The whole of his stacks are now completely covered, and the yard makes a very decent figure as to size, notwithstanding of the high cut which most of the crop received. At the same time, I am sensible that, had he cut as you do, seven or eight stacks more might have been put up. However, this loss must be submitted to; though next year, I hope, the crop shall be cut in a very different manner. I am happy, however, to see so much bulk, when the work was so imperfectly executed.

The remainder of the summer fallow was yesterday sown with wheat, part of which I purchased from my predecessor; and as it seems to be of a different kind from the one you recommended, I will have an opportunity of judging next year of the merits of both respectively. I noticed, however, when it was in ear this summer, that a vast number of *blacked* heads, something like what often appears amongst barley, was amongst it. Perhaps one ear in ten was in this imperfect, or rather useless state; and of course, I apprehend this variety will be comparatively unproductive. It shows, however, a good sample, seems to yield more straw than any other, and probably may make up, in these respects, what it apparently wants in others.

I have sold the country beasts purchased at the summer markets, and have netted exactly three pounds ten shillings upon each beast, which you will allow is a very decent profit, to speak in the language of Northumberland. I am going to Falkirk in a few days to purchase thirty-five stots, if they can be got, thinking them to be the best sort for wintering in the straw yard, receiving a few turnips and ruta baga in March, April and May, and soiling afterwards. I know you always recommend beasts for soiling to be in good condition before the grass season; therefore trust my plan will meet with your approbation. If you are at Falkirk, I will be happy to receive your advice and assistance.

October 28.—Wheat seed is now finished with me for this season, having sown altogether sixty-eight acres, viz. thirty-eight acres upon land that had been summer-fallowed, and thirty acres that had carried peas and beans to my predecessor. I had an intention of trying ten or twelve acres of clover stubble; but after hearing my father's opinion upon that point, gave up all thoughts of attempting wheat thereupon, as he thinks oats to be a more certain, and, at all events, as valuable a crop. He urges, that clover stubbles seeded with wheat are constantly in bad condition after the crop is reaped; whereas, when seeded with oats, a good crop may not only be expected, but, what is of greater importance, the ground will always be found in order for carrying peas and beans as a preparatory crop for wheat. These reasons induced me to change the resolution originally formed, though I mean to sow with wheat in the spring all the land cleared of turnips before the first of March. I will, however, sow our usual autumn wheat, having no favor for the new kind of spring or summer wheat so keenly recommended by that respectable gentleman, Sir John Sinclair, Baronet. I am satisfied our climate does not suit that variety. It may do in Sicily or Egypt, but will not answer in this country. From a conversation the other day, with that excellent and assiduous agriculturist, John Christian Curwen, Esquire, President of the Workington Agricultural Society, I noticed, with pleasure, that his sentiments respecting spring or summer wheat, are precisely the same with what I have formed on the subject. Mr. Curwen has tried this newly introduced variety to a great extent; therefore is a competent judge upon its utility. In fact, the variety seems to be recommended as a *succedaneum* for barley after turnips, now when the culture of that valuable grain—valuable certainly upon light soils—is discountenanced by the legislature of the country.

I was sorry that you was not at Falkirk, as expected. I purchased there thirty very good Fife three-year-old stots, which probably may feed to forty stones Amsterdam, or thereby. I intend, after the stubbles are ranged, to give them straw till the middle of February or so; after which, they shall receive a tasting of turnips and ruta baga. Of my twelve acres of these roots, I am almost sure that six acres will fully supply the ewes; therefore, the remainder will be of great advantage to the cattle. I shall take care to proportion the quantity in such a way, as that the ruta baga may last to the first of June, when cutting grass is to be expected.

Since wheat seed was finished, I have entered upon the fields, intended next year for turnips and ruta baga, giving them a deep furrow, in imitation of your practice. I mean, next, to plough the bean land, though I am not resolved whether to give a cross furrow, or to gather up the ridge. Could a good spring season be depended upon, I would adopt the last method, and give the cross furrow previous to the seed one. Perhaps it may be best to try both ways, as, by acting in this manner, there is a chance of being more successful, than by exclusively adopting either the one or the other mode.

The horses are now put upon hay and corn, and are in good spirits. My predecessor speaks of not intending to thrash any of his peas and beans till after Martinmas; so I must keep to hay till that time. It is a great matter to have horses in order at this season of the year; as, if they get out of condition at the begining of winter, it is hardly practicable to make them up for many months, with every indulgence. I mean, therefore to be particularly attentive to their keep at this time, and next week to give up two journeys *per* day. As field labor is in an advanced state, one journey of five hours will, in my opinion, answer quite well till the spring quarter arrives.

November 25.—As the land intended for beans and peas has now got the first furrow, part in length, and the remainder across, we have now begun with what is meant for summer-fallow. I have ordered that a deep ploughing shall be given to these fallow fields, knowing, unless it is completely ripped up, that no after exertion can compensate any defect in the first instance. I have taken particular care, that the head-lands and *gaw*-furrows of every field ploughed, shall be sufficiently digged and cleaned out, so as a drop of water may not stand upon them during the winter months. This was an advice which you constantly inculcated; and, if I recollect right you often said, that, at one glance, you could determine whether the general management exercised upon a clay land farm was good or bad, merely by looking at the head-land furrows.

My predecessor is busy thrashing out his crop, and rather proceeding faster than is desirable. It is foreign to my inclination to have any dispute with him, either on that or any other matter; therefore, though he could be compelled to thrash in a regular manner, I am stacking the straw in the yard, which will, at least, serve for littering in summer. It is built with care, and the stack being carried up in leets, may be expected to stand the weather without sustaining much injury.

The invitation given in your last, to spend a few days at Barnhill, is highly acceptable. I trust to be accompanied by my father to your hospitable mansion—a mansion where business is never neglected, nor the slightest departure ever made from good order and regularity. There I spent twelve months with great satisfaction; and thence I expect to derive happiness for many years. You have been always good to me; and I can only show the gratitude implanted in my mind, by desiring most sincerely to receive a greater favor than any hitherto conferred upon me.

Class IV.

December 15.—I have the satisfaction of acquainting you, that I got safe home from Barnhill and that all things had gone on well during my eight days' absence. Indeed, my foreman appeared to have been particularly attentive to the instructions given him at my departure; though, as the weather remained steadily dry, they were easily followed out. It is under different circumstances that absent masters suffer most. They go from home, leaving directions—probably very proper ones at the time they delivered, though quite irrelevant when a change of weather occurs. If such directions, therefore, are literally obeyed, much loss necessarily ensues. Hence the utility of a head-servant, of good capacity and sufficient experience; one who can form a new plan of action upon the spur of the moment, and with precision apply it to the different people over whom he possesses a temporary government. Though the abilities of my servant were not completely tried during my short absence, still I am inclined to think them above an average. He is sober and steady—qualities of great importance; and, having got rather a better education than common, is free of prejudice, and eager to introduce every new improvement which has the appearance of being useful.

If any thing could lessen the pleasure of the visit to your house, it was the absence of my father, who, you know, was unluckily confined to his room at that time by indisposition. I am happy, however, to acquaint you, that he is now restored to health, as you will observe from the enclosed extracts of the letter sent me yesterday. It was out of my power to see him on my return from your house; but, knowing his anxiety about the business which carried me there, I wrote him immediately. Very likely, a copy of my letter may afford some satisfaction to you and your worthy family.

" Dear Father,—I felt great concern at your being unable to meet me at Barnhill; especially as the business in view was of such a nature as materially to influence my future welfare and happiness. Upon my arrival at Barnhill, Mr. Jamieson showed me your letter, the contents of which damped my spirits, and certainly served to lessen the pleasure which otherwise would have been enjoyed at his hospitable mansion. Trusting you are now in a convalescent state, I proceed to detail the leading particulars of my visit, firmly convinced that you and my mother must be highly gratified at my meeting with such a favorable reception.

" I found your old friend in good health, and as active and attentive to business as when I was in his service. The first and second days were spent in examining the farm, and inspecting the live-stock; but of these things we will talk afterwards. With regard to the chief object of my visit, suffice it to say, that after several conversations with Miss Jamieson, I ventured to disclose my sentiments to her father, who received them in the most favorable manner. 'George,' says he, 'I have no objection against receiving you as a son-in-law, having formed a good opinion of your principles; but you will attend, that, in a matter of such moment to my daughter's happiness, I will not presume to dictate to her in the slightest way. If you can gain her consent, neither mine nor that of Mrs. Jamieson will be wanting. Indeed, neither of us were so short-sighted as to be ignorant of your intentions long before they were formally announced. One thing, however, I must tell you, which is, that my daughter will not have a large fortune; therefore, if you are guided by expectations of that nature, you will be completely disappointed.' I quickly replied, 'My dear sir! it is not money, but a good wife, that I am in quest of. From my knowledge of your daughter's disposition, I entertain not the slightest doubt of her making an excellent wife: therefore, money-matters shall be left entirely to yourself.' The ice being thus broke, I applied to Miss Jamieson, who, in the most agreeable manner, referred me to her parents; and I have the inexpressible pleasure of acquainting you, that every thing was soon arranged. Mrs. Jamieson, however, insists, that the connexion shall be delayed for a few months, so as she may have time to prepare her daughter's *providing*—a phrase well known in your neighborhood, though likely unknown amongst our southern neighbors. To this delay I was obliged to yield a reluctant consent, being of opinion that, after parties understand one another, no time ought to be lost in bringing such a business to a conclusion.

" Be so kind as let me know, per return of post, concerning your health. And with love to my mother, and other relatives, I am your," &c.

My father's answer to the above was highly gratifying. After mentioning that his health was completely restored, he adds,—" I feel the most heartfelt satisfaction at the prospect of your connexion with such a truly respectable family—a circumstance of more importance to a young man than generally imagined. Mr. Jamieson has been my intimate and steady friend for thirty years. Often have I received benefit from his advice; and, though both about the same age, I have somehow or other greater respect for his sentiments than for those of any other cotemporary. He is not only a prudent, but a good man; therefore, I must regard your connexion with his family as the most fortunate circumstance which could befal you." So speaks my worthy father; and, by doing so, increases the obligations which, from first to last, I have been under, to his parental goodness. After these egotisms, you will likely wish to know what is doing upon the farm. At this time, the detail shall be given in a few words.

The fields intended for summer-fallow next year are nearly ploughed; and, when that work is finished, it is proposed to break up some of the old grass land. I formerly mentioned that fifty acres were in grass, of different ages, last season, all of which is meant to be ploughed for oats, except a ten acre field that is reserved for the ewes. Upon this field they are to receive turnips, either during a storm of frost and snow, or when the spring season arrives, as it will not be prudent to give them any of the young grasses till they have dropped lamb. As yet, I have only lost two ewes, which I presume, out of six score, does not exceed an average loss. The remainder are in excellent condition; and, having been tupped about the end of October, may be expected to drop lamb in the end of March, or thereby. The cattle wintering in the yard are thriving well. Hitherto, they have got only one double cart-load of turnips per day, which, amongst thirty beasts, can only be considered as a tasting. Abundance of good straw being furnished, they have been kept in good order by that quantity of turnips; but, in a few weeks, I mean to increase it to two loads.

I have *spoken* to my servants, as it is called here; in other words, have *engaged* them for another year, upon the same terms as formerly. Upon the whole, each of them has behaved well; therefore, no advantage could arise from making a change. I have not taken them bound to provide *workers*, as many people do; considering such a practice to be arbitrary and oppressive. If a servant has children capable of working, it is fully more for his interest that they should earn wages, than it is for that of the master who employs them: therefore, as voluntary work is to be preferred to that which has the appearance of being compulsory, I thought it better to make no agreement on this point, further than that those who were capable of working are to serve me in preference to any other person; it being always understood, that, for their labor, payment is to be made according to the rates given in the neighborhood. This regulation is so fair and reasonable, that no servant can object to it.

January 10.—A heavy snow storm came on a few days ago, and occasioned the ewes to be put upon turnips without delay. As the storm was preceded by a week of frosty weather, due warning was thereby given to draw a quantity of turnips, sufficient for a month's consumption, and to drive them to the gate of the park where the ewes were depastured. From the *depôt* thus provided, my herd drives three cart-loads of turnips every day, which I find, from trial, to be nearly the quantity the ewes can consume. The cattle now get two cart-loads per day, from a similar *depôt* in the stack-yard: and, as such storms rarely last longer than a month, I hope the quantity stored will answer till a change of weather ensues. I have provided two pairs of broad cylindrical wheels for driving turnips from the field afterwards, as the ground must be in a wet condition when the storm goes away.

To give employment to the horses, I am preparing to empty the straw-yards, when the whole materials therein accumulated will be regularly mixed and prepared as dung for next year's turnip crop. I do not mean to pile up those materials in the way recommended by some people; but to drive carts upon the site of the middenstead, taking care to spread the whole in the most minute manner. Had the materials been rotted, or even imperfectly rotted, a different course would be the preferable one; but most of them are nothing but straw, hardly in a wet state therefore could not be manufactured into dung in the fashionable way. The small quantity of dung gathered from the stables and byres shall, however, be carefully interspersed with the layers of straw, so as fermentation may follow. To hasten the process, it is proposed to cover every layer from the courtine one foot thick with snow which is understood to be an excellent expedient.

Most of my neighbors are complaining grievously of the state of corn-markets. They allege, and probably with some justice, that, while farmers have heavy war-taxes to pay, which of course cannot be done unless increased prices are received for their produce, importation of grain from every quarter of the world, even from those nations with whom we are at deadly variance, is countenanced and encouraged by the government of the country. Being at this time little interested in such discussions, I cannot say my mind has been turned to them; but I shall communicate the substance of what a friend of mine urged upon the subject the other day in a public company. His antagonist, a gentleman who seemed to favor the manufacturing interest, contended, that farmers could not be justified in complaining against the importations from foreign countries, or of the encouragement given by government to such importations, so long as importation rates were below the average of our corn-markets; because it was to be presumed every farmer held these rates in view when agreeing for his farm, and framed his offer accordingly. In opposition to this doctrine, my friend maintained, that the importation-rates were framed for peaceable, not for warlike times; and that, if the farmer was to be subjected to war-taxes, he undoubtedly was entitled to partake of one advantage hitherto enjoyed by the growers of home grain during war, namely, a more limited importation from foreign countries; whereas, under the new-fangled and modern system of granting licenses for importing grain from our inveterate foes, the home market was inundated with foreign grain much more than in former times, when Britain was at peace with all the world. He likewise maintained, that the distresses of the farmer were much increased by the particular specialities of the season. The calamities of a bad harvest must be submitted to. This he cheerfully allowed; but, though submission is due to the dispensation of an allwise and overruling Providence, he contended, that it was neither wise nor just in the government of the country to adopt measures calculated to increase the calamities which had befallen the agricultural interest in consequence of the adversities of the season. He admitted, that it was prudent to import foreign grain to a certain extent, so as the deficiencies of the home crop might be supplied; but decidedly contended, that, to encourage foreign importation to such an unprecedented extent, was a measure, under the circumstances of the case, calculated to beggar the majority of British farmers;—depriving them, in numberless instances, of a market, and causing their grain to remain either as a dead stock in hand, or to meet with a sale upon the most disadvantageous terms. The truth of these observations shall be left for your determination.

February 8.—The storm of frost and snow ceased last week; and is succeeded by fine genial weather. This favorable change allows the clover leas to be ploughed; and we are busy with them: though, till the end of the month, I do not mean to go more than one journey per day. I intend, as soon as possible, to ridge up the turnip land that is cleared, and have it seeded with wheat. Since the storm went away, two cart-loads of turnips have only been given to the ewes per day; which seems to be sufficient, there being a considerable quantity of old fog still upon the pasture-field. The cattle receive the same number of loads; and are evidently on the improving hand. The straw-yards were completely emptied of their contents during the storm; and two large middens were made, both of which seem to be in a forward state, throwing out a great smoke every morning, and compressing in a gradual manner. A large quantity of snow was mixed with the materials, which, I have not the least doubt, will produce an important benefit.

The prohibition against the use of corn in the distilleries, has occasioned, of late, several meetings of this county; and I have paid some attention to the arguments used for withdrawing the prohibition. It is right to state, that the adversaries of the prohibition admit, in the fullest manner, the propriety of prohibiting distillation from corn, when there is a scarcity of that article in the country. They contend, however, in the first place, that barley and oats, the articles used in distilleries instead of being scarce, have been fully as plentiful in Britain, during the two last years, as at any former period; therefore, that the prohibition was not only an unnecessary, but a dangerous measure, if it was solely meant to prevent an evil, of which there was no reason to entertain any apprehension. In the second place, these gentlemen contend, that to relieve the West India planter, at the expense of the British farmer, was the real cause of the prohibition, though such a cause could not be prudently assigned by those who promote that measure. To me there appears no doubt about the matter. In fact, the government of Britain, for more than a century, has rather inconsistently shown a greater desire to promote the prosperity of the colonies, than to advance the internal improvement of the parent country. I shall not trouble you by investigating the policy or impolicy of such a system, though to that source may be traced the law which prohibited the use of corn in the distilleries of Great Britain; a law, which shuts up one of the best markets farmers had for the disposal of their produce; —a law, which obliges the British people either to consume spirits of an abominable and destructive quality, or to refrain from the use of them altogether; the high duties upon wholesome foreign spirits serving as effectually to prevent three-fourths of the nation from using such spirits, as if their consumption was expressly prohibited by an ordinance of King, Lords, and Commons, in Parliament assembled.

March 10.—Having ridged up the land cleared of turnips, it was sown yesterday with wheat of the autumn kind; having resolved, as formerly intimated, to have nothing to do with the varieties of spring or summer wheat, so anxiously patronized and recommended by the Board of Agriculture. The wheat was accompanied with grass-seeds, though some of my neighbors think, if they vegetate soon, damage may be sustained from the April frosts. Of this I entertain no apprehension; remembering, when in your service, of the like practice being extensively followed without any disadvantage. No more than five acres of the turnips are yet removed; so, about seven acres of them and ruta baga remain for spring consumption; which, supposing the ewes to get the supply hitherto given, will fully carry on the cattle till the season of grass arrives. All the grass land is now ploughed, and to-morrow I mean to prepare the bean land for drilling. On these accounts, we are now going two journeys per day, though it is difficult to make out nine hours work in the field. The day, however, is gradually lengthening, and next week there will be no difficulty in making out the full time. The weather being dry, I propose to cross-plough, in the first place, the land that was ridged up last winter. This being done, we shall harrow it; then drill it up; and, after the seed is deposited, reverse the drills, so as the seed may be covered. The success of these complicated processes depends entirely upon the weather; therefore, no time shall be lost in carrying them into execution. The other fields intended for beans, shall only get one ploughing, after being completely harrowed. They were cross-ploughed in November, and it is proposed to run the drill-barrow after the third plough. This comparative trial will serve to ascertain which of the methods is best, though, *prima facie*, it appears, the more work that can be given to land in the spring months, so much cleaner must it be for the succeeding crop of wheat, providing it is in proper condition when the work is performed.

Whenever the bean land is seeded, it is proposed to sow the oats, though, probably, part of that work may be undertaken, should the weather be such as to interrupt the processes of preparing and sowing the bean land. Some of the land ploughed from grass will require a good deal of harrowing, especially what is of clay soil, and was ploughed after the storms of frost and snow. The horses, however, being fresh, and all in good condition, I have not the slightest doubt of getting on full as fast as any of my neighbors. Indeed, if I do not get faster on this season than other people, it would be impracticable to execute the work of the farm afterwards, without the aid of another pair of horses. I have no corn to thrash, and, of course, none to drive to market,—operations which would require one day in the week to execute; therefore, I must be either overstocked this year, or understocked the next one, if the same strength is kept in both seasons.

When mentioning the horses, I may inform you, that one of them was lately attacked with a violent inflammatory cholic, the cause of which I cannot assign, as, to my knowledge, he had got nothing but his usual food, and had performed no more than his ordinary share of labor. I ordered the farrier to bleed him in the first instance, and then to administer a dose of laudanum. As the complaints were not thereby abated, I directed injections to be given, (which were absolutely necessary, as he could not get any passage backward), and then to bathe him completely with blankets soaked amongst warm water. I sat by him the whole of the first night; and, with the aid of a servant, endeavored to prevent the injury often sustained from tumbling and rolling under the pain of such an agonizing trouble. Next morning the horse was not much better; and, as he steadily refused all sustenance, either of meat or drink, unless administered by the horn, the farrier gave him up. It is an old saying, that so long as there is life there is hope; so I determined every thing should be done for the relief of the horse which could be thought of. The farrier was therefore directed to back-rake him repeatedly, and to administer fresh injections. Two servants were appointed to attend constantly in the stable, and to rub him heartily about the belly whenever he stood upright. A small quantity of boiled barley was also given every hour by the horn; and some meal and warm water, in which a little nitre was mixed, were given in the like manner. Notwithstanding of the farrier's predictions, our patient showed signs of convalescence on the fourth day; and by a continuance of care, appeared quite well in the week afterwards. I used him gently for some time, and now he is as stout and healthy as any horse in the stable.

March 30.—I have now finished the sowing of oats and beans, and am quite satisfied with the appearance of the fields after being harrowed. I had, however, to roll part of the bean land, in order to make it decent to the eye in the mean time, and fit for the horse-hoe afterwards, though I am not sure whether the crop may be benefited by such a process. I have likewise sown three acres of tares, to be cut as green food betwixt the two crops of clover, and mean to sow other two acres in a fortnight, under an impression, that when the second crop of clover fails (and it does fail in particular seasons, upon the very best land), it is almost impracticable to carry on the work of a farm without such a succedaneum. The oat fields, upon the whole, took on a good skin, though some of them required five double times of the harrow before they were sufficiently pulverized. They are all neatly water-furrowed, and the cross furrows are digged out with the spade. I was careful to select oats for seed which were pure and unadulterated. Those purchased were chiefly of the potato variety, which, in my humble opinion, is far superior to any other, when sown upon fresh and rich soils. Ten acres of the thin clay soil are, however, sown with what is called Angus oats, thinking that field not in condition to carry a full crop of the other sort.

A few of the ewes have dropped lamb; and it being absolutely necessary that they should now be regularly attended, I have ordered the shepherd to remain the whole day, and as much of the night as possible, with them in the field. I propose next week to remove all that are lambed from the old pasture field, and to put them upon the young grasses; thinking this the best way of giving a full supply of milk to the lambs. A cart-load of ruta baga shall, however, be given each night, so long as needed; though I apprehend, if the weather continues favorable, that auxiliary article may soon be withdrawn, the appearance of the young grass being very promising. I mean to allot forty acres of grass, in the first instance, for the ewes; which is one acre of grass for three ewes. As the lambs are taken away, this quantity shall be lessened according to the season; but, at all events, I hope it will be in my power to save ten acres for soiling in the end of July, having found last year the inconvenience of wanting green grass at that period. If I do not need it for soiling, the alternative of making it into hay remains; and in one or other of these ways, the grass can be used with advantage.

The land intended for potatoes, ruta baga and turnips, this year, is now getting a cross furrow, and stands much in need of a ripping up, being in many parts very full of quickens. Perhaps the fields intended for these roots may contain 35 acres, or thereby; though, as there is much foul land in the farm, nearly the like quantity will remain to be summer-fallowed. I hope this arrangement will meet with your approbation, though contrary to the one originally chalked out; which, in fact, could not be executed in the first instance. You will be so good as attend, that the whole 35 acres that are meant for turnips, &c. are of soil admirably calculated for these crops; hence, you will recognise the propriety of extending their culture as far as possible. By doing so, the farm will be enabled to keep a large stock of cattle and sheep next season; a circumstance of the first importance in every situation, because in no other way can a farm be so speedily and substantially enriched. Be assured, however, if the ground cannot be prepared in a husbandmanlike manner, that such a quantity of turnips shall not be cultivated. It is my wish to do every thing well, and never to attempt pushing any plans further than warranted by existing circumstances. The extent of ground proposed to be turnipped and summer-fallowed, viz. 70 acres, certainly exceeds the work usually performed by five ploughs; but, as I will get early at the ploughing, and am not to drive any lime this season, I do not despair of accomplishing the undertaking. At all events, I will purchase or hire additional strength, rather than suffer the radical work of cleaning the ground to be imperfectly executed. It is a material object with every incoming tenant, to put his land in order as fast as possible; and, under the influence of this impression, I am led to make an exertion this year, which afterwards, I trust, will be altogether unnecessary. To dung the whole land proposed to be turnipped and fallowed, will be impracticable; but as grass-seeds are to be sown with the corn crop which follows, the want of manure may in some respects be compensated by additional pasturage.

April 18.—The ewes are all lambed, and for several days have been fed entirely upon the young grasses. From 116 ewes, the number that remains, (four having died in winter and spring.) I have 153 lambs; most of whom are healthy and thriving. The grass fields, indeed, are good, yielding a full bite; and, should the weather continue temperate and dry, there is every prospect of bringing the young stock to market in a month, or thereby. We had one bad night at the throngest of the lambing-time, which caused three new dropped lambs to perish; but, if the like occurs again, I am resolved to bring the whole home to the stack-yard, where they will be completely sheltered.

At this advanced period of the season, I thought it prudent to take up the ruta baga, and get the ground thereby prepared for barley. After cutting off the tops in the field, which were given to the cattle as fast as they could use them, the roots were driven home, and piled in the stack-yard. The quantity that remained loaded 105 carts; so I will be in no want of green food for the cattle till the season of cutting grass arrives; which, according to present appearances, will be about the last week of May. The cattle are in a thriving state; and after a month's soiling, may be expected to be in condition for the butcher.

The field which carried ruta baga, was prepared for barley immediately after the roots were removed. It was cross-ploughed first, then harrowed and rolled, and afterwards ridged up, and sown with barley and grass-seeds. It looks tolerably well to the eye; though, unless moisture is soon received, the seed must vegetate imperfectly. This is a defect which accompanies the system of feeding in April and May, not to be removed unless early storing is resorted to. I have sown the fallow wheat-fields with grass-seeds, and given them a substantial harrowing. Part of the land, where the wheat plants appeared loose at the root, were also rolled; though I know you are not an advocate for rolling land that has lain through winter under the harrow process. The seeds were sown in the same proportion as last year. Indeed, a thick seeding seems at all times advisable.

Having now finished seed-work, I shall detail the extent of land under the several crops, &c.; which at one glance will show you the system adopted for this season. The farm is not yet in shape; therefore, the mode of cropping suggested in a former letter, could not at this time be precisely followed.

Wheat—after summer fallow - -	38 acres	
after beans - - - -	30	
after turnips - - - -	5	
	——	73
Barley—after turnips and ruta baga -		7
		—
Carry over - -		80

Brought over - -		80
Oats—after grass - - - - -		40
Beans—after lea oats - - - -		40
Tares—after ditto - - - - -		5
Potatoes, ruta baga and turnips—intended to be taken after wheat and lea oats -		35
Summer fallow—after wheat - - -		35
Old pasture - - - - - - -		10
Clover and rye-grass—sown last with fallow wheat - - - - - - -	40	
Ditto - - - ditto with barley	10	
		50
Fractions of the several fields -		5
Acres -		300

It was once my intention of giving a particular account of the expense required to stock and cultivate the farm to this date. But observing that this letter has already run to a great length, I must confine myself to an abstract detail of that expense, without going into the *minutiæ* thereof.

Ploughing, harrowing, rolling and hand-gathering turnip and fallow land last year, before the term of entry - - - - - -				L. 50	10	0
Grass-seeds for 50 acres - -				50	0	0
10 plough horses, at 55 guineas each				577	10	0
1 old horse, as a supernumerary -				20	0	0
1 saddle horse - - - - -				60	0	0
3 milch cows - - - - -				48	0	0
Ploughs, harrows, carts, rollers and other implements - - -				165	0	0
Saddler's account for harness, &c.				52	10	0
Sacks, ropes, &c. - - - - -				14	5	0
Balance of arbitration with outgoing tenant, and expense thereof -				23	12	0
Cleaning turnips, filling dung, spreading lime, and other incidental expenses, last summer - -				35	0	0
Allowance to 7 servants for harvest maintenance last year, 3 firlots of meal each—*Inde*, 5¼ bolls, at 24s.				6	6	0
Expense of altering and improving the dwelling house - - -				52	10	0
Furniture purchased, independent of linens, &c. from my mother -				300	0	0
Horse-corn last summer - -				64	16	0
Ditto from September last to this date, 120 bolls, at 24s. - -				144	0	0
Corn for 7 servants, one year, at 17 bolls each—*Inde*, 119 bolls, at 28s.				166	12	0
Smith, wright and saddler for one year - - - - - -				45	0	0
Lime purchased last summer - -				70	0	0
Seed-corn, viz. 64 bolls wheat, at 45s.	L. 144	0	0			
6 bolls barley, at 32s.	9	12	0			
38 do. oats, at 28s. -	53	4	0			
50 do. beans, at 30s.	75	0	0			
5 do. tares, at 50s. -	12	10	0			
				294	6	0
Grass-seeds, this year, for 50 acres				50	0	0
Window tax, horse tax, &c. - -				25	0	0
Incidental expenses, last winter, to this date - - - - -				10	0	0
6 score of ewes, at 33l. - - -				198	0	0
30 stots for wintering, at 15l. - -				450	0	0
Household expenses since Whitsunday, as per book - - -				120	0	0
Carry over				L. 3092	17	0

Brought over				L. 3092	17	0
To which may be added,						
Expense of thrashing-machine, fanners, firlots, and other barn implements not yet valued - - -	L. 120	0	0			
Horse corn till harvest, 70 bolls, at 25s. -	87	10	0			
Household expenses till ditto - - -	50	0	0			
Incidental expenses in summer - - -	30	0	0			
Harvest expenses -	100	0	0			
				387	10	0
				L. 3480	7	0

From the above, it appears, that a farm, such as mine, cannot be stocked, in a substantial manner, at a less sum than 11l. 12s. per Scotch acre, or 9*l*. 5*s*. 6*d*. sterling per English acre. Indeed, the tenant of such a farm ought to possess an additional sum at the outset, otherwise he stands a chance of being short of money before his first year's rent is paid, few farms being capable of paying full rent in the first instance.

It may probably be alleged, that the profits on cattle kept during the first summer, and those that may be gained from the live stock this year, ought to be deducted from the above sum of capital stock, as these profits will be in hand before the period arrive when the account is finished. Though this is true, still, it will not warrant such a deduction from the amount of stock; because these profits must be appropriated to the fund out of which the first year's rent is to be defrayed—a fund almost, in every case, a short one; therefore, standing more in need of aid, than capable of giving any assistance to supply a deficiency of original stock.

Next week, it is my intention of being at Barnhill, when we will talk over these matters. Nay, more, if the *providing* is all ready, or nearly all ready, I trust, that a business upon which the happiness of my life in a great measure depends, will be concluded to the satisfaction of all parties, and of none more than

Your friend and servant.

ON BREEDING AND REARING HORSES FOR AGRICULTURAL PURPOSES.

From the Franklin Farmer.

The No. for June 1st offers premiums for the 1st and 2d best essays "on the subject of breeding and rearing horses for agricultural purposes." The writers are laid under no restrictions as to the mode of discussion, or the breeds they may choose to advocate. An agricultural paper could not be expected to have been more liberal. A dissertation on the blood and proportions, the breeding, rearing and training the turf race-horse, or the stouter built, but not much less blood-like roadster, hunter, or war-horse, which the advance of modern times has introduced, might not have suited the taste of a majority of your readers. You are aware however, that by placing an interdict on the turf, the camp, the field and the road, you damp the ardor of your writers, and strip the horse of his glory.

The plough and cart horse is a mere utilitarian, and ploughing and carting, however the poets may have embellished them in song, are known by the *Workies* to be plain fact matters, and effectually achieved by the due and continued application of bone and sinew. There evidently is no fancy in the affair to the man who holds the handles and guides the team. There is however, ample room for the exercise of much practical good sense in pointing out the best method of breeding, raising, breaking, and working farming horses to the best advantage. The profits of agricultural operations generally are moderate, and managed as they are in many instances, loss is incurred. Most breeders of animals, it is apprehended, receive but a very inadequate compensation for their time and attention and money expended. It ought not to be, and that it is, does not result necessarily, but from the want of proper care and judgment in breeding and raising. They follow what has been not inaptly called the hap-hazard mode, by putting any sort of a female to any sort of a male, without regard to qualities, and in raising they are so stinted and starved, as to warp and destroy whatever little of good form and constitution they may have accidently brought into the world with them. These seem to act without object, except, that they know a horse is a horse, and a steer a steer, and that if the colt was got for a barrel of corn, and the calf gratis, that they have saved their money.

The business of breeding animals, in modern times, is said to be science. It has not been however, and probably never will be reduced to exactness. "Dame Nature" in her operations delights to display endless varieties. But certain rules have been laid down, by the observance of which we may reasonably expect to approximate certainty. "Like begets like" is the leading rule. It not only has its exceptions, but it must be understood with limitation. Select a horse and a mare, such as you want, or as near as you can find, the produce of their conjunction may resemble the sire, or the dam, or neither; but it may have an intermediate form, or may take after some remote ancestor; and if the remote ancestors were indifferent, or positively bad, the chances will be against the rule, in proportion to the number of worthy progenitors. It should be enjoined on beginners, therefore, 1st, to select good animals to start upon, where no better evidence can be had; 2ndly, but where it can, to select them from good families. In England, where more attention has been paid to the breeding and rearing the blood horse, than in other countries, they have arrived at extraordinary size, and power and endurance; and it has been done by combining the Arab, Barb and Turk, and developing the bone and muscle of the new race by generous feed and judicious exercise. There no one thinks of breeding a racer from a mare who has not at least five pure crosses. And many of their most distinguished mares can number double the amount, landing on a royal, or other Arabian or Barb mare. There is something in the blood, that gives family distinction, though the blood may not tell in particular individuals, either from mismanagement or accident, or from some defect in constitution or form. A third rule requires that they be crossed; in other words, that we avoid the coupling together near relatives. The more remote the families, probably the better; but after prohibiting the intercourse of sire and daughter, brother and sister, beyond these we may probably be permitted to use our judgment in selecting the requisite forms. Some of the double Januses were very well proportioned, but they were very small. The double Archys evidently show a falling off. But Wagner by Sir Charles out of a Marion is thought to be among the good ones. And we need not look for a better than Highflyer, his dam by Blank, got by Regulus, both sons of the Godolphin Arabian.

There are some subordinate rules, that in the thorough-bred studs, should be well considered. 1. Certain families cross better than others, as being good. 2d. Certain individuals cross better than other individuals. 3rd. And certain individuals breed better than other individuals. Herod and Eclipse were extraordinary racers and stallions, and were of good families, and they crossed well upon other good families. But the union of their bloods was rather transcending, and were we to select from the best of Eclipse's sons, we should take these—Benningbrough, Waxy and Gohanna, all out of Herod mares and Hamiltonian, out of Highflyer, a son of Herod. Sir Archy and Eclipse of Long Island are both good stallions, and their blood is thought to cross well; but the blood of Eclipse and Rattler, son of the Sir Archy, "nicks." These last rules are to be learned by practice only. Who can assign the reason why Rattler's immediate descendants have not shown his worth? In them it is measurably dormant; but it is shining with resplendant lustre in Mingo and Job, of the second generation. And of Job it was hardly to have been expected, as he combines an unusual proportion of Diomed and Sir Archy blood, being bred very much "in and in."

The thorough-bred horse, standing evidently and acknowledgedly in the first rank, the rule for breeding and raising him being "considered and freely understood," a variety suited to a particular purpose is to be produced by considering the properties wanted, and the families and individuals from which such properties are most likely to be inherited. Were the thorough breeds equally numerous, and bred and raised at the same or nearly the same cost, I would say without hesitation, and so would every one who understands his interest, put the thorough breds to work. Eclipse, or Rattler, or Tranby, or Mingo, or Job, if put to it in their prime, would have done more work than any inferior bred horses of their size. In June or July, blood will tell as promptly in the corn field as on the race course. My best breeds always then take lead. But the above, and such as the above, are not accessible to farmers generally. The price forbids. What then is to be done? In this glorious land of liberty, every one, who has the means, does as he pleases, and I only wish, I can scarcely hope, that some individuals or companies or agricultural societies would import a bay Turk, a bay Barb and a Cleveland bay, and bay dray or draught horse. The Cleveland bays are said to be almost uniformly of bay color and universally gentle in harness. I have seen a few matches from the north, apparently half breeds, excellent in harness, of the desired size and shape.

Draught horses, perhaps equal to any, might be had in Virginia or Pennsylvania. The stock should all be selected by a competent judge of horse flesh, and the two coarser kinds should be chosen not only with a view to their own stoutness, but family stoutness and gentleness at work, and with a scrutinizing eye to their hoofs and pasterns. Brittle horn, gummy ankles, or tendency to grease in the heels should be an insurmountable objection to a horse, however perfect in other respects. We would of course have to choose the temper of the Barbs and Turks, though a man thoroughly conversant with horses can from certain indications form a tolerably correct estimate of their tempers. A person but moderately acquainted would be able to know that Belshazzar was quiet, and that St. Giles was "queer." The mares to be selected, should be well bred, of bay or brown color and a few grays. They should have long heads, wide between the eyes, and jaws well displayed, with clear placed eyes, and open foreheads, with pointed, well set ears, and fine muzzles and nostrils; necks of moderate length and muscular, with large detached windpipes; having quarters before and behind with plenty of muscle; large bodies with large ribs, and the short ribs close to the hips; standing even and rather wide on legs abounding in bone and sinew, and terminated by tough black hoofs. A white pastern and hoof is about as liable to disease as those of black or dark chesnut color. The stallions should be of similar shape, but more coarseness is tolerable in them, particularly about the neck. The mares above described of 15 1-2 hands high or upwards should be put to the Barb and Turk; those under, to the Cleaveland bay. Those three crosses in the general would produce stock of sufficient size. The best of the colts should be kept for stallions. When a filly was deficient in size she should be put to the dray horse. The crossing and the result of each cross should be regularly recorded. If of very defective form she should not be permitted to breed, or be put to a jack. If the mule inherited the defect, it would not be perpetuated. And all the blind fillies, and those having defective eyes, should be put to a jack, for a blind mule would be a curiosity. A colt thus bred might be kept as a coverer at about $10 the price of the season of one mare. And where the blood had been diluted by the blood of the dray, at $7 50 or perhaps $5, which should be the minimum price. Am I asked why the expense of importing a Barb and Turk should be incurred? It is answered, the Byerley Turk and the Curwen Bay Barb got a colt and filly, the sire and dam of Partner, one of the best horses ever bred. He got Tartar, a capital one. He got Herod, the lasting properties of whose stock have probably never been equalled. He got Highflyer, who had no parallel in his day. He got Sir Peter, a good racer, and, as a stallion, without a parallel in his day. He transmitted his excellence to Haphazard; and he to Philho-du-puta; and he got Birmingham, who, but for the inroads made on his constitution by bad management, might have perpetuated the family stoutness. Perhaps it may be done by Philip, who came of Treasurer, a daughter of Camillus, "whose stock were particularly neat and of great strength for their size."

Having chosen the right sort to cross, and thereby bring on a new variety, the mode of raising them may be described in a short compass. The mares and horses should be in good health and condition, when put together. During the period of gestation the work to be done by the female should be moderate, and as she approaches the time of delivery, the work should be suspended and her condition a little improved. The male should not probably be worked, but plenty of exercise should be given him regularly, and his powers should never be overtaxed. The foals, for the best, should be dropped when the grasses are plenty to increase the flow of milk, or, if the mares are to be worked after foaling, generous food should be given them in sufficient quantities. The young will learn to eat at three or four months old, and may be weaned at five or six. They should be sheltered from the inclemencies of winter, and fed to keep them straight and growing, without being forced to precocious maturity, as is done in England, in the racing studs. The object of the forcing system is to attain size and strength to enable them to contend in "their 3 year old form" for the high prizes. The Derby, the Oaks and St. Leger stakes have attractions for breeders and sportsmen; and are annually won, not always by the best colts and fillies, but are annually the means of destroying, or greatly impairing the value of many good ones. Nature would indicate that a horse should have attained full age before he is put to his utmost exertions. Foals should be gentled immediately after their birth, and they rarely, perhaps never forget it. Yearlings also should be kept growing uniformly in winter as in summer, and at 2 years old should be halter broke, and used moderately at three, increased in work at 4; and a filly at 5, will do full work, but a gelding not before six, perhaps 7. Very often, however, they are broke down before they are aged by improper management, and thereby several of the most valuable years of their lives are lost or rendered nearly useless.

A few objections may be answered to enable us to come to a close. It is said that the skins of the well breds are fine, and liable to chafe and gall. The gear should be made to fit, be of good quality, and kept soft and pliant. It is objected against the breds, that they are bad tempered, and restive, and unmanageable. The objection applies not generally but to a part, and a small part only. The finest, and the best tempered, and altogether the best carriage horse I ever saw, was a Pacolet out of a Spread Eagle. And as to the restive, begin with them young and learn them obedience by times, and keep them obedient. If they are suffered to run wild till four or five years old, you should expect trouble, unless you employ a "whisperer." I had a filly, whose sire had a decidedly bad temper, and her dam's sire was equally vicious. She was worked tolerably well at three years old, but was injured so much by another team that she was turned out for the season, and the next year refused. She bred me a filly, sold for the saddle, and a colt, that works kindly, before I sold her, and a better roadster than her is rarely to be seen. I had two fillies full bred. The one was put to work at three years old and worked kindly. The other was a splendid creature, that I used under the saddle; but on one occasion and without requiring her work, but rather to see whether she would work, I put her to the plough. As she did not like it, and fearing she might be injured, I ordered her to be stopped. I have latterly worked a full bred of the same family; and another thorough-bred in the wagon, merely to see that they would work, and they are now both valuable brood mares, the thorough-bred a splendid mare, and has a splendid filly.

Wm. Williams.

AGRICULTURAL AND RURAL ECONOMY OF FRANCE.

Extracts from Birkbeck's Tour.

"In every part of France women employ themselves in offices which are deemed with us unsuitable to the sex. Here there is no sexual distinction of employment: the women undertake any task they are able to perform, without much notion of fitness or unfitness. This applies to all classes. The lady of one of the principal clothiers at Louviers, conducted us over the works; gave us patterns of the best cloths; ordered the machinery to be set in motion for our gratification, and was evidently in the habit of attending to the whole detail of the business. Just so, near Rouen, the wife of the largest farmer in that quarter, conducted me to the barns and stables; showed me the various implements, and explained their use; took me into the fields, and described the mode of husbandry, which she perfectly understood; expatiated on the excellence of their fallows; pointed out the best sheep in the flock, and gave me a detail of their management in buying their wether lambs and fattening their wethers. This was on a farm of about 400 acres. In every shop and warehouse you see similar activity in the females. At the royal porcelain manufactory at Sevres, a woman was called to receive payment for the articles we purchased. In the Halle de Bled, at Paris, women, in their little counting houses, are performing the office of factors, in the sale of grain and flour. In every department they occupy an important station, from one extremity of the country to the other.

"In many cases, where women are employed in the more laborious occupations, the real cause is directly opposite to the apparent. You see them, in the south, thrashing with the men under a burning sun; it is a family party thrashing out the crop of their own freehold. A woman is holding plough; the plough, the horses, the land is her's, or (as we have it) her husband's; who is probably sowing the wheat which she is turning in. You are shocked on seeing a fine young woman loading a dung cart; it belongs to her father, who is manuring his own field, for their common support. In these instances the toil of the woman denotes wealth rather than want; though the latter is the motive to which a superficial observer would refer it."

* * * *

"From Dieppe to this place, [Montpelier,] we have seen scarcely a working animal whose condition was not excellent. Oxen, horses, and now mules and asses, fat and well looking, but not pampered. This looks like prosperity. And when I add that we have not seen, among the laboring people, one such famished, worn out, wretched object, as may be met with in every parish of England, I had almost said on every farm; this, in a country so populous, so entirely agricultural, denotes real prosperity. Again, from Dieppe to this place, I could not easily point out an acre of waste, a spot of land that is not *industriously* cultivated, though not always *well*, according to our notions. France, so peopled, so cultivated, moderately taxed, without paper money, without tithes, without poor rates, almost without poor, with excellent roads in every direction, and overflowing with corn, wine and oil, must be, and really is, a rich country. Yet there are few rich individuals.

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"In the agriculture of France there is a great sameness. The arable land, which comprises almost the whole surface of the country, the vineyards, and a few tracts of mountain excepted, may be divided into five classes, according to its fertility, without regard to the nature of the soil. The first bears a crop every year, as in Auvergne, in the neighborhood of Toulouse, in some parts of Normandy, &c. This description is highly cultivated, and on a principle well adapted to soil and circumstances. The second somewhat inferior in quality, but good land, is also judiciously cultivated, with the intervention of a fallow once in six years; as about *Dieppe* and Rouen. The third, land of middling quality, which embraces a very large part of the kingdom, is managed on the old plan of fallow, wheat, oats. The fourth, poor land, which also covers a large space, is fallow and wheat alternately. The fifth, land still poorer, is cultivated in the round of fallow, rye, rest without grass seeds.

"The first and second classes include what there is of variety and spirit in French husbandry. In the south, Indian corn alternating with wheat exhibits management as good as the beans and wheat of the best English farmer: and the varied routine, observable in the north, affords many proofs of a spirited and judicious culture. It is the three last which betray its weakness. If they comprise half the cultivated surface, which I believe is not overrating their extent, half of that portion being fallow, it appears that one-fourth of the whole country is lying in a state entirely unproductive, a few weeds, mostly thistles, excepted. A very few half-starved sheep are kept to pick over the constantly recurring barren fallows, often accompanied by three or four long-legged hogs. On the borders and out of the way corners, you may see a cow or two with an attendant. But there appears so little for any of these animals to eat that you wonder how even they are supported. The *prairies artificielles* (the artificial grasses as we less properly call them) of which so much is said by the amateurs, are like specks of green on a desert. Clover and lucern are cultivated with great success, on the two first classes of land; but very rarely indeed on the others. Thus there is probably as much really waste land in France as in England, and it is of an expensive kind: whereas our wastes support much more stock than theirs, without any expense whatever. It has been said that it would be vain for the French to increase their flocks, because they have already as much mutton as they consume; and there would be no market for more. This sort of argument would hold equally against every other improvement. The price of mutton is fully in proportion to that of grain. Mutton is 5d. per lib., wheat 5s. per bushel. With us, mutton is 10d. per lib., and wheat 10s. per bushel. Cheese and butter rather exceed in price this proportion; beef is about the same. Thus it appears that stock pays as well in France as in England. The French sheep are chiefly remarkable for their long legs, thin carcases and coarse wool. The same characteristics prevail from north to south, except that in the north they are larger, stouter and bear finer fleeces; in fact, they are better treated than in the south. The best flocks we saw in the country were here and there one of the Spanish breed, which we took care to visit when we heard of them. We were anxious to obtain information respecting the Merinos of France, for which Buonaparte has done so much; as we had been taught by the *knowing* on our side of the water. The history of our proceedings in this business is just a counterpart of theirs. In 1786 Louis XVI. established a flock at Rambouillet; the produce was at first given away, or thrown away, exactly as was the case in England. Here ends the first chapter. Recourse was then had to public sale; and the higher the prices, the more eager the purchasers. This high-priced stock was well attended to, and succeeded accordingly. Fine wool was produced and offered to the manufacturers, who did not meet the wishes and expectations, probably unreasonably ones, of the growers. This is the second chapter of their history; precisely like our own, but unfortunately for the French sheep-masters, it proved of much longer duration. The revolution came on, during which manufactures suffered, and the wool still lay upon hand. At length, in an evil hour, Buonaparte (whose ambition branched out in every possible shape) resolved to cover France with fine woolled flocks, and published his famous decree of the 8th of March 1811. This gave the final blow to the Merinos. As soon as it appeared, all sales of sheep ceased; and even agreements, which had been previously made, were set aside. From that time to the present the breed has been declining in France. An effort is now making in its favor, by the law which has just passed, allowing the exportation of wool and rams."

MODE OF PREPARING LAND FOR RUTA BAGA. YIELD OF THREE ACRES.

To the Editor of the Farmers' Register.

Middletown, Monmouth co., N. J.,
November 12*th*, 1839.

Dear Sir—In your October No., there is an article on the culture and cost of three acres of ruta baga, copied from the Monthly Visitor, published in New Hampshire, which I read with considerable interest as I do all other communications having reference to the progress of root culture, that important auxillary to successful farming. In fact, the writer is perfectly convinced from many years experience and observation, that no plan or system of agriculture can be complete without roots forming a very prominent part in the rotation; and the time will come, though now apparently distant, when not only Virginia, but all the eastern states will be independant of the western country for their supply of beef cattle. It is possible, however, that the American farmers, who are so sensibly alive to every principle of self-interest, may obtain a complete knowledge of the cultivation, and proper and economical use of this invaluable root, much sooner than many people expect, who have made the subject a part of their study. Independantly, however, of the farmers individually comprehending this matter, it is essential also, that the laborers should understand, and by practice, properly and directly at the first, become expert with the hoe, and in singling out the young plants without even for a moment thinking of touching them with their fingers, however close they may be in the row. In entering into a consideration of the expense stated to have been incurred (130 days at a cost of $98,) in the culture of three acres of turnips, I must confess that I never was so much at fault in my life, in being unable to comprehend how it was possible so large an outlay of labor could have been devoted to that object. It is presumed that in New Hampshire, hoes have not, as yet, found their way, but that the good farmers there proceed on the principle that "fingers were made before forks," and have used them where the hoe, plough or drill ought to have been exclusively made use of. Besides, something is said about making out the land in squares, and shaking over each intersection, seeds contained in a box, 2 or 3 in a place, transplanting where they failed to come up, &c., altogether a bundle of absurdities and perfectly contemptible, were it not that this was the first attempt on the part of the New Hampshire farmer, to raise a crop, (in which he appears to have been eminently successful,) of the root of all roots, notwithstanding President Mose's famous recorded declaration that they are "utterly worthless, composed chiefly of fibrous matter, a *simple hydrate of wood.*" Oh! what a sentiment for the president of an agricultural society to deliver! To be charitable, however, it is inferred that he never saw a crop of turnips which had been sown in proper season. From this digression I will proceed to say, that I never saw any thing more than half a crop of any root obtained by dibbling, or what is the same thing dropping seeds here and there; and early observed that the principle was wrong, and the practice productive of nothing but disappointment of a very grevious nature. Whoever is parsimonious in seed, particularly turnip seed, or beets for field crops, will reap his just reward. One pound of the former, and four of the latter, is the proper quantity which the drill in use on this farm will distribute with the utmost precision, the plants standing in the row, on an average, half an inch from each other. But why have them so thick? That is a question which has been put to me a hundred times. The answer has invariably been: You cannot obtain a *full plant in their proper places*, except there are a superabundance of them to enable you to make a proper selection when they are hoed to their proper distance. But, there is yet, another argument in favor of thick sowing. An attentive observer of the turnip crop will remark a vast disparity in the general appearance of the plants as regards strength, and of their fitness to remain, four days after they are up. How can this circumstance be accounted for. Certainly not, that some seeds are more favorably situated than others, as respects germination, &c., for it is found that plants in close affinity, present the same striking contrast, and may be noticed every where along the rows. Is it constitutional in seeds, as in animals to produce weak and strong of their kind? The writer has long thought so, from the result of several experiments he has made with different seeds, particularly the turnip, and uniformly arriving at the same conclusions, that one-fourth are unfit to be retained to stand for a crop. Hence, the importance of a liberal allowance of seed. Should the foregoing reasoning on this peculiar character of seeds be deemed by you of any importance, a further elucidation from so competent a source, would be interesting and useful. In harvesting a crop of turnips, that plan is best which admits of the least handling, the operator taking hold of them with the left hand and with a strong knife in the other, trim off the fibrous roots, and top them while yet in his hand, throwing them into the furrow, placing three or four rows together, for the greater convenience of loading. It is deemed advisable to top and tail no more than can be secured the same day, choosing dry windy weather for the business. To keep them through the winter, the plan adopted on this farm is the same as the one practiced by the New Hampshire farmer, and is the very best that can possibly be devised.

In feeding turnips, my space will only admit of my stating generally that all animals except calves prefer them in their whole state. As a matter of precaution, the small ones ought to be reserved for the hogs, or cut up for the calves and yearlings, excepting there is kept on the farm an implement for dislodging potatoes or turnips from the throats of animals. It is labor misapplied, to cut or mangle roots in any form. What a business it would be to pass through a vegetable cutter the daily allowance of a thousand sheep and fifty bullocks! Animals eat them as we do apples, bite off bit by bit, with exquisite relish. What, not slice them a little for the poor little sheep? No! Positively injurious to do so. Neither for the hogs, no matter the size, the larger the better. Twenty hogs are generally wintered on this farm exclusively on this root, with a daily allowance, as near as can be guessed, of 10 lbs. each, increasing to 12 as spring advances. No corn or grain of any description is given.

The preceeding remarks are hastily thrown together for the benefit of those whom they may interest, but more particularly for the perusal of Virginia farmers, and for the author of the communication which has drawn them out.

In conclusion, a brief statement is given of the expenses incurred by the writer the present season, in cultivating three acres of Swede turnips, and presuming 2100 bushels to be the produce, a comparative statement may then be found.

Dr.

Interest on land, $100 per acre	$18 00
Twice ploughing three acres	6 00
Harrowing do.	1 00
Seed	2 00
Ridging, two furrows thrown together, the tops of ridges three feet apart, one day	1 00
Drilling the seed, and rolling with a light roller taking two rows, one day	1 00
When the plants have six leaves, ploughed from the ridge a light furrow each side, going as near as possible with a one horse plough, one day	1 00
Setting out the plants to 10 and 12 inches apart; this operation must not be delayed five days	5 00
Hoeing tops of the ridges effectually at the same time, then return the furrow each side carefully; and presuming the work well done, there will be no weed alive	1 00
Carry over	$36 00
Brought over	$36 00
In three weeks, governed by the condition of the land, run the cultivators one bout through the intervals	50
Then with the hand hoe, go over again, cutting out here and there weeds that have escaped former hoeings	50
In a few days plough out the middles, which will close the account for cultivation, one day	1 00
If any more work is requisite, pass the cultivator through the intervals. The harvesting of a crop of 2100 bushels, would occupy 4 men and 2 teams 3 days, say $1 each, board and wages	12 00
Cr.	$50 00
2100 bushels turnips at 10 cents, all they are worth for feeding $210	
Profit	160 00
	$210 00

Cost of production in New Hampshire, $128, in New Jersey, $50, difference $78.

Referring to my farm journal, for a series of years the whole cost of production has never exceeded four and a half cents per bushel.

William Bowker.

"JOTTINGS DOWN" IN THE SWAMPS.

(Continued from page 703.)

No. 4.

The wild swamp lands, and the lake.

Somerset Place, N. C., Nov. 23.

The great swamp of North Carolina, which fills nearly all the space between Albemarle sound and Pamlico river, was at first called the "Little Dismal," in contra-distinction to the "Great Dismal," in Virginia and the adjacent part of this state; and this misnomer of the former is still continued, though it has been long known that it is much the greater of the two. Four lakes are in the interior, of which Pungo and Alligator lakes are much smaller than Scuppernong, (which is 8 miles long and 5 miles wide,) and Mattamuskeet much larger, the latter being from 60 to 40 miles in circumference. The courses of all the streams, some flowing out of all these lakes, and the various head branches of the great swamp rivers Alligator and Pungo, all serve to show that the greater interior space of the swamp region is much higher than its borders, and that its surface descends on every side. Lake Mattamuskeet lies nearest the sound, and was most accessible. Much of the swamp land on its margin has long been drained and cultivated, but in a very imperfect manner. With this and a few other exceptions, nearly the whole of this great region still remains in its natural state, and very little of it has been explored, so as to be well known, even by bear hunters, and much less by any other persons.

Pungo Lake lies within two miles of this, and the works for draining that lake by the government of North Carolina are now in the course of execution. I should be very glad to visit that work; but though so near to this place, it is totally inaccessible at this season; and could not be reached directly, even in the dryer time of summer, without cutting a path through much of the impervious thicket.

In the language of the residents, the lands of this great region are distinguished by different names, representing different qualities or conditions of swamp. The first is *swamp land*, which term is not commonly used, as by me, for the whole morass, but is confined to the kind covered by large forest growth, of which cypress and black gum trees are the most numerous. This is the dryer part of the general swamp, and it is sometimes so clear of under-growth that there would be no great difficulty in walking over such land, but for its wet and miry soil. *Juniper swamp*, is altogether different from what is usually meant when "swamp" simply is spoken of. But though abundant in other parts, I have met with no juniper lands in my limited view of the great swamp. This kind is merely rotted vegetable matter, and having no change or difference of subsoil, to any known depth. This is the most usual kind in the Dismal Swamp in Virginia, and was described fully in my observations thereon, published in a former volume. (Far. Reg. vol. iv, p. 513.)

Savanna land is the name given to another very large proportion, and which perhaps is the larger part of the interior or highest part of the whole region. Still, relatively to the nearest *swamp*, or forest-covered land, the savanna has the lower level, as it is more generally and deeply covered in water. The savanna has no trees, except a few scattering and stinted and ragged pines. The under-growth is of evergreen bushes, as laurels, bays, &c., vines of various kinds, and in some places is exclusively of reeds. None of these usually rise higher than about 10 or 12 feet. But the growth is so dense that it is almost impossible to penetrate it, without the previous slow and laborious process of cutting a passage through. The savanna which lies across the lake from Somerset Place extends to Mattamuskeet, and perhaps farther in other directions. The lower part of Mr. Collins' land, which has long been under forest growth, is remembered by Mr. Pettigrew to have been savanna many years ago. The change has probably been induced by the partial exclusion of the water, after the canal began to operate. I therefore infer that savanna differs from the other swamp merely in being more subject to water, therefore the soil, for the time, is still more of vegetable material, and therefore, as well as on account of its kind of growth, more often and thoroughly burnt over, when long droughts have permitted fires to spread, and sometimes to burn away the soil itself, as well as its growth.

For the purpose of having a closer view of the great savanna, as well as for the pleasure of the excursion, I sailed across the lake in Mr. Collins' nice little pleasure boat. We approached the edge within about 60 yards, which was as near as the boat could keep afloat over the shoal bottom. But no better view could have been gained even by landing on the miry soil, which is now scarcely as high as the present surface of the lake, and of course is full of water, and often overspread with it. But the wet and boggy state of the soil would have been the least of the obstacles to further progress. The covering thicket seemed so dense as to be impenetrable any where, and the sight could not have extended through more than a few feet of distance. If, however, the observer could be elevated above the low tops of the reeds and shrubs, there appeared nothing to obstruct the view for many miles. The few dwarfish pine trees, whether yet alive, or killed by fire, served but to deform the otherwise uniformly beautiful, though varied growth.

When this water excursion was made, the sun was unclouded, and the weather, though cold, bright and beautiful. The color of the lake, as seen from the shore under this sun-light, was a deep dark blue. But when sailing over it, and looking down upon the water, the color appeared to be dark brown, though perfectly clear of muddiness. When seen however, in a drinking glass, it is but very slightly tinted with the vegetable extract which gives the much darker color to all the waters of the adjacent swamp, as well as to other swamp lakes. This is therefore considered a "white water" lake, as distinguished from other swamp lakes. Contrary to what would be supposed, it is said to be the least colored when the water is lowest in the lake. It is free from all taste of vegetable or other impregnation, and is a delightful drinking water.

I also visited the savanna on the eastern side, beyond Mr. Pettigrew's farm, by walking on the margin of the lake as far as possible. The water would have then flowed a few inches deep over all the savanna, but for low dikes built along the margin to prevent the water spreading across the savanna to the cultivated back lands of the farm. And it was evident that in the present state of the lake; (which is not the highest usual in winter,) that its water, if unobstructed, would spread over all this part of the unreclaimed savanna.

Several persons though residents, and well acquainted with the ground, have lost their way and their lives in the swamp, and not far from the then boundary of cultivation. Of two who are known thus to have perished, the skeleton of one was found many years after, and identified by the remains of the iron tools which he had carried with him. Of the other no trace has ever been found. These facts, better perhaps than any general description of mine, will serve to convey some idea of the difficulties of getting through the thickly overgrowth and treacherous bog, and of the lost wanderer's keeping any one course without the guidance of the sun, or some other sure indication of direction.

The irregular margin of the swamp land, shows that in storms the lake has made inroads and widened its surface on every side, but mostly in the directions to which the violent winds most generally blow. Cypress trees, still living, though for ages perhaps surrounded by water, in many places stand far from the shore. And in others, where the trees have preserved the soil, little nar-promontories of high and forest-covered swamp jut out between the indentations washed out of more yielding earth. It is probably owing to this cause that the bottom of the lake next the shore is so shallow as to be left naked several hundred yards in width in the lowest state of the water. Beyond this, the depth increases suddenly, and the central and great body of water is from 8 to 14 feet in depth. The height of the surface is reduced from 1 to 3 feet by the summer drought; and the greatest reduction known, below high water, was 4 feet perpendicular.

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No. 5.

The general plan of drainage, as executed.

Somerset Place, Nov. 23.

About 1770, Josiah Collins, the oldest of that name, together with two other persons formed a copartnership under the name of the "Lake Company." They took up nearly all the surrounding swamp land, by laying their own patents, or buying the small patents of other persons, in cases where the land had been previously thus appropriated. The only tract which is not embraced in this extensive property, (which was more than 80,000 acres,) is the farm of Mr. Ebenezer Pettigrew, lying on the lake next to Somerset Place. The interest of the two other members of the copartnership was afterwards bought out by the elder Collins (the grandfather of the present occupant,) and the property has been divided among his descendants. Somerset Place, the individual and distinct property of Josiah Collins esq. is 3000 acres, extending from the lake on both sides of the great canal into the lower and still wild swamp land in the rear. A small part only of this has been improved; and the actual drainage and cultivation extends on the lake side over several hundred acres of the share of another member of his family. But the whole tillage and management is as one farm, and by Mr. Collins; and therefore it is not of his separate property, but of the cultivated land that will be spoken of as his farm. This explanation is perhaps uncalled for; but it is made to avoid even the appearance of mistake or erroneous statement on this head.

The great work of draining on this and the adjoining and similarly situated estate (Mr. Pettigrew's,) and the great value thereby created, are matters of general notoriety; and long since I had heard of the work through verbal report, and, as I now find, very incorrect report. It had been supposed by me, from such accounts, that the object and effect of the great canal was to *lower* the level of the water of the lake very considerably, and thus to leave higher the swamp land around. This is indeed the general plan proposed by the report of the former engineer of the state, Mr. Shaw, for draining the public swamp lands around other lakes, and which plan, it is said, is now in the course of execution, by digging a canal to draw off the waters of Lake Pungo. This supposition was entirely wrong. Whatever might have been the opinions and secondary objects of the first proprietors, (the Lake Company,) the great and primary purposes of their main canal, (as are its main effects,) were, first, to provide a good navigable outlet from the lands designed to be drained, without which the future products would be valueless, because they could not possibly be sent to market; secondly, to bring into extensive use, for propelling machinery, a water power of any desirable amount; and thirdly, that the canal should serve as the final and general receiver of all the water collected by the numerous smaller drains, which are made to draw from every acre of the estate. But it is obvious that this last important and indispensable operation, of being the general receiver of the drained water, could not have been effected, except by the surface of the water in the great canal being *lower* than all the swamp land to be drained on its borders, and than all the smaller drains leading to the canal. But to have the water of the canal thus lower, (as it now is,) can only be done by commanding, regulating, and limiting, the rate of supply from the lakes. For if suffered to flow unrestrained, though the highest part of the canal is but 20 feet wide and 4 feet deep, the flood which would pass through would cover permanently and deeply nearly all the area of swamp designed to be drained. The usual height of the lake water has not been lowered but very slightly by the vast and continual draught made by the canal; and the land-holders, so far from desiring to lower it very considerably, would wish by all means to avoid that result. Even if drainage were the *sole* object, and to be attained without regard to expense—and if, with that view, the canal had been made twice as deep as this and three times as wide—though such a channel might have discharged ten times as much water, it would have been insufficient always to keep down the level of the waters to the reduced and usual height; and if, by its actual operation, the canal had left free from water, and dry enough for tillage, a narrow border of some of the highest land, it would also, by throwing an enormous, variable, and therefore totally uncontrollable flood, cover ten times as much land lying on a lower level, but equally capable of being drained by proper measures. The impropriety and danger and enormous expensiveness of this mode of drainage will be evident to any unprejudiced and careful observer.

It has been already stated that the central parts of the great swamp region are the highest parts; and much higher than the lands, whether swampy or firm, that lie nearer to the outlets of the swamp waters by streams and rivers. This and other lakes are in the central parts of the great swamp, and their waters are sometimes as high as the highest parts of the adjacent swamp. Sometimes in the dryest seasons the level of the water of this lake has been lowered 4 feet; but the usual height is generally restored by the next rainy spell; and sometimes with so much excess, that the overpouring flood spreads over the outer swamp lands, several feet deep, before it is discharged into the rivers. Such are supposed to be the general facts, as merely inferred however in part. But these I now leave, to state what I have examined in regard to Mr. Collins' drained land, of which the comparative levels and other circumstances are known with certainty.

The water of the lake is now, (though not at the highest mark,) as usually, except in dry seasons, within a foot of the highest, and is overflowing the lower parts of its natural brim, or margin; and would even now flow over the highest parts of the cultivated fields, but for the low dike which has been constructed along the lake side, and which is one of the permanent roads. From this more elevated margin of nearly two miles in length, the surface of the land, (now all dry,) is naturally an inclined plane, with a very uniform rate of depression to the side of the estate most distant from the lake. The rate of declination of the surface, as shown by the canal, is much most rapid nearest the lake; and is equal to 6 feet perpendicular in the first quarter of a mile. Below, it is more gradual; but in the whole course of the canal, of something more than 6 miles, the fall is between 18 and 19 feet, and of the swamp land along side, nearly as much. It will be obvious, from these circumstances, that if, (for example) the depth of two feet of earth only were cut away, or removed horizontally from the margin of the lake, that a broad sheet of water of a foot in depth would be poured over the whole of the most elevated side of the land, and pass over the whole farm, (if no artificial obstructions existed) to escape at the opposite and lower side. To guard against any such invasion from water, the lake-side dike, though so little elevated as to be scarcely visible, and seeming as merely designed for the road, serves as a secure barrier. This very regular inclination of the surface of the land, with the supply of water at the top, would permit the easiest, and the most abundant as well as extensive irrigation of any yet effected by art, if the aid of watering should be desired hereafter. It is upon this general and regular inclination of the land that the scheme of its drainage was founded, and on which its successful operation depends.

The digging of the great canal was the first work, and this was completed about 60 years ago, by the Lake Company, at a cost of $80,000. Its course is perfectly straight, so far as visible on the farm, and is at right angles to the side of the lake where it enters, and its direction is with the greatest descent of the surface of the land. To a quarter of a mile from the lake, where the water-power is used for the mill and other machinery, the level of the water is kept up, for a head. To that point, the water is kept in by its banks, and stands at the mills 6 feet higher than the cultivated fields on both sides. Below the mills, the water of the canal is lower than the adjacent land whenever the mills are not at work, and the full flow of water restrained; but higher when that flow is used or permitted, which is usually the case, except at night, and in wet seasons when it is necessary to afford a continual outlet to the rain from the fields. The canal receives the water collected from the land by nearly all the drains, through three several and remote channels; of which the two on the higher levels are kept shut, by close flood-gates, when the mills are grinding and the canal receiving its full supply from the lake, and are opened whenever that supply is shut out by a flood-gate across the canal, near its junction with the lake. Thus all the water collected by drains from more than 1200 acres of the arable land is shut in usually through every day, and only permitted to run out at night; and that the accumulation in the lowest ditch is not enough to hurt the arable land, is the strongest evidence of the dry state of the reclaimed land. The third passage into the main canal enters so low down, that it is left open at all times, the water in the canal at the junction being the lowest where this supply enters. There is also another place of discharge from some of the drains most remote from the canal, at the opposite side through a small arm of Scuppernong river, which originally was the only natural channel, in usual seasons, of the surplus water of the lake.

There are five main drains, 8 feet wide, running through the land parallel to the canal; these are crossed at right angles by "leading ditches," 6 feet wide, and at distances of a sixth to a quarter of a mile from each other. The banks of these leading drains are all thrown on the side towards the descent of the surface. Of the "lake side ditch" which is also nearly parallel to these, the earth dug out was thrown to the opposite side, towards the lake, to help to form a road there. The design of this is different from the leading ditches, it being to catch the water which oozes under the road embankment, from the much higher and adjacent water of the lake. The banks of all these main drains and of the leading ditches crossing them are formed into good and permanent farm roads; and these roads, together with the main road of the farm, amount to 24 miles in length, and of course there are as many miles of the large drains. The rectangular spaces formed by these great drains, are again intersected by three-foot ditches running *down* the slope of the land, and emptying into the leading drains below; these are crossed by small and shallow "tap ditches" (such as are elsewhere called "grips,") at every 50 yards distance. Finally, the entire surface is ploughed into ridges, for corn, of 5 and 6 feet, with good water-furrows between. Thus the water-furrows collect all surface or rain water, and discharge it into the shallow tap ditches, which empty into the deep 3 feet ditches, and these into the 6 feet leading ditches, these into the 8 feet main drains, and these into the canal, or the other and natural outlet. The tap ditches are only about four inches lower than the water-furrows, and do not obstruct the passage of the teams and ploughs. They are easy to dig, but require cleaning out after every ploughing of the field. The three-foot ditches are 2 feet deep, and the two larger kinds are 3 feet or more, and the canal, 4 feet. The water is so directed that each large drain discharges its proper share. All these kinds, from tap-ditches to main drains, amount to 180 miles in length of ditching, on the farm of 1400 acres drained and cultivated. The whole operation of the drainage seems very perfect. The soil, considering the loose texture of much of it, and its absorbent character, was surprisingly dry; as dry indeed as such soil, and of such a level surface, could have been expected to be, if free from all higher water.

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No. 6.

The soil, and its former and present vegetable products.

Somerset Place, Nov. 26.

The labors executed by the present proprietor in the short time that he has had possession (11 years) have been great, even for the large force and capital employed; and the performance has been the more remarkable as being conducted by one who was very young, and totally inexperienced. He has drained, and brought into cultivation 500 acres of the now cultivated arable surface of 1400, besides other and perhaps as arduous labors, which are not required on other kinds of lands. One of these was the clearing up the dead trees of much land drained before his arrival, in addition to that labor on all the newer part.

The killing of the trees of the natural swamp forest, and grubbing and removing the shrubs and small trees, is comparatively but a light job: But until the last of the gigantic cypresses so left yields to the wind, and is prostrated, there is a yearly recurring labor required to remove the fallen trunks.

The great size of the old cypress trees generally, and of other trees also, but more rarely seen, is beyond the expectation of any one who sees them for the first time. Very many are five feet through the body at 4 to 6 feet from the ground, and would carry a diameter of 3½ to 4 feet for 40 to 60 feet, the length of their trunks. Some cypress trees are much larger than these sizes. One in the field I was told was 30 feet in circumference, as high as the measurement could be conveniently made. The age to which they live, and their durability after death, are not less remarkable than their size. Mr. Collins has counted on the sawed end of a cypress log, more than 800 rings of the grain, showing as many years of growth; and as this and others that he has counted were by no means of largest size, he supposes that their ordinary and natural term of life must be 1000 years at least. But this estimate does not go back to the earliest existence of some of the dead trees, by many centuries. There has been at least one generation of cypress trees which lived and died here before the oldest of these now standing sprang up. Of this fact I was shown several sufficient proofs, of which I will state the case proving the most ancient date. A trunk of a cypress, long dead, but still standing firmly in the cultivated ground, had been found by measurement to be 33 feet in circumference at 3 feet above the present surface of the ground. The surface probably has been lowered nearly as much as from the mark of measurement stated; and this has exposed the upper parts of the roots of the tree, and also the before buried body of another prostrate and large cypress, over which the trunk of the standing tree had grown. The visible wood of the buried tree is still sound. These "ground logs," as they are called, are so numerous under the swamp soil, that it would seem as if the trunks of the more ancient forest, thus buried, were as many as the trees now standing above them.

The whole of the reclaimed land was, when taken into cultivation, of what is called "cypress and gum swamp." The soil to the depth of 2½ or 3 feet, is very much like that of the newly reclaimed tide-swamps of James river, and is as much formed of vegetable materials. When new and in a dry state, this will take fire, and burn to the depth of 18 inches or more. But open and "chaffy" as is this vegetable soil when first cultivated, it produces very heavy crops of corn. The subsoil is of compact blueish clay, which becomes friable and fertile soil by exposure; but for this subsoil, the soil could not, as I think, be deemed a permanent possession. But there is enough elevation to spare several feet without injury in that respect; and when the soil has rotted away, as it does in time, and allowed deep ploughing to bring up the clay subsoil to the surface, a still better, and what I suppose will be a permanent soil, is thereby formed. In the oldest cultivated parts, the extent of this loss of soil and depression of level, though greater there, cannot be measured or estimated. But in the land cultivated this year for the first time, though drained long before, the mark of the former surface can be fixed by the dead trees and stumps whose roots are now so far naked as to make it evident that the surface is already two feet lower than formerly. Yet the material of this soil, though rotten, is but little decomposed; and must lose much more in bulk before it is brought to the state of fine black mould, like the land which has been brought under tillage ten years or more. The first ditches which are dug in a new piece will barely reach the subsoil; but with every year's cleaning out, a little more of it is dug up, until most of the depth of the ditch is in the subsoil. But this rotting away, which would render entirely worthless (as it does our tide-swamps and marshes) any land which cannot spare 3 feet of its upper soil, is here productive of no greater evil than the necessity of continuing to deepen the ditches, so as to keep their bottoms as much below the subsiding surface as at first. This land will sometimes bring 12 barrels of corn to the acre, and often as much as 10 barrels. This year the crop is very inferior, owing to the ravages of the chinch-bug, and Mr. Collins supposes that it may not average more than 5 barrels. From the size of the stalks I should have guessed a much heavier product. The largest crop which he has made in any one year was upwards of 8000 barrels. The land nearest the lake is stiffest, (or seems to partake more of the nature of the subsoil,) and is the most productive in wheat. A particular portion has been known to produce 37 bushels of wheat to the acre. Still however, this crop has been so uncertain that Mr. Collins has recently abandoned its culture, except on a small scale, for home consumption. One important cause of failure is the great growth of partridge pea. Another plant which grows with remarkable vigor is chick-weed, which I have not seen abundant any where else. Here, after corn, it usually covers the whole surface with a thick matted though low growth, and being a vine, clings to and runs upon every thing within its reach. It is now green and in full vigor. It serves as excellent winter pasturage for sheep.

In a small part of the land, the trees had been cleared away at once, by being cut down, instead of the ordinary slow and gradual course of "deading" them, or killing them by cutting slightly around, and then letting them stand until overthrown by the progress of time and decay, aided by the force of the wind in storms. The former course has been found to be very objectionable, and is abandoned. The large cypress stumps will remain to encumber the ground for 50 if not 100 years, and more than any other tree, even if equally durable, because of their large size. All the roots of the cypress strike downward and deeply, none running horizontally or nearly so. Hence, even after the surface of the earth around may have been lowered by decay a depth of two feet, and of course as much of the formerly underground parts of the cypress exposed, still the lowest part appears to a stranger to be not of root, but of trunk, and merely shows a still greater enlargement of the always broad pedestal to the mighty column. Thus there are but few dead cypresses, or their stumps, which do not spread across the width of a five-foot ridge, and obstruct one if not two water-furrows; and many of the largest extend across more than double that width, and of course are serious impediments to the drainage of the obstructed water-furrows. Long as the cypress resists rotting, it is a very brittle wood, and is very easily broken by storms. Scarcely can a large living tree be seen in the original forest of the swamp of which the top has not been broken off by wind, and replaced by a subsequent growth, of different form. And the dead trees left in the drained land are generally soon divested of branches and tops, and reduced to a naked trunk of 40 to 70 and 80 feet high. This resists the wind much longer; but finally, by the decay and weakening of the roots, they yield, and the trunk falls. The roots are broken in such cases not far below the surface, and the blowing down of the decayed tree leaves no deep or considerable hole in the earth where it stood. I saw measured one of the recently overthrown and broken trunks, which was 72 feet long, and all of clean body, below the lowest branch. This was 5 feet through above the swell near the root, or where the regular and very gently tapering form began. Another of less length of trunk was 6 feet through the body, measured as above. These were not selected as being of uncommon size, (for very many in the forest are said to be much larger,) but merely to serve as standards of comparison. For without using some such mode of comparison, a stranger would be deceived as to the general size. If one only of these great trees were found elsewhere, its size would strike every beholder with astonishment, and it would be supposed greater than it really was. But here, they are so numerous, and the forest growth and every thing else is on so gigantic a scale, that the eye has no accustomed and known objects by which to measure dimensions so large, and, by a slight and hasty observer, all objects would be supposed smaller than they are.

Rice was cultivated here by the Lake Company, to considerable extent, and with good success. But the culture was found to cause so much sickness among the slaves, that it was abandoned. The successive parallel slopes, ditches and embankments, formed by the "leading ditches" which run across the ground, afforded great facilities for flooding the land, and drawing off the water when desired, for rice-culture. Subsequently, corn was the main crop, and cultivated for a long time successively on the same land. The present proprietor has found the very long continuation of this crop objectionable, and has commenced, as a regular course, to cultivate corn for three years in succession—and then to let the land lie out of tillage three years, and be grazed in the middle one of these three years. He is very careful to cover up in the soil for manure all the rank growth of weeds, which now stand 7 to 8 feet high; and also the corn-stalks, shucks, and the growth of grass underneath, when corn is again to follow the next year. To effect the object, and enable the plough to cover so heavy a growth, it is first weeded off the beds (5 and 6 feet wide) by broad hoes, and drawn into the water-furrow, and then two furrows of a plough are run to throw the slices so as to meet on the weeds. This is very roughly and imperfectly effected; and after standing a while, two more furrows are cut in the same places, and the earth thrown again over the weeds, and then the balance of the old ridges reversed and the new ones finished. The corn-stalks are cut off and drawn with the grass into the water furrows, in the same manner.

No. 7.

Uses of water power. Mr. Pettigrew's farming and improvements.

Somerset Place, Nov. 25.

The extensive use made of water to save labor on this estate, is one of the most interesting subjects for observation. It has been already stated that the descent of the canal gives a head of 6 feet of water at the mills, at the distance of a quarter of a mile from the lake. Part of this power works a saw mill, and a corn and wheat mill of two pair of stones, with the bolting and other machinery, &c., proper for the making of flour. Also the corn is shelled and fanned, and, though not now, formerly the wheat was thrashed, and cleaned by the water-power conducted to the barn and one of the great corn houses. Besides these more important operations, and for some of which there is daily use made of the water-power, it is also directed to crushing and grinding corn in the ear for horses and other stock, the working a circular saw, turning grindstones, and may be substituted for hand labor in various other ways. When it is desired to prepare a cargo of corn for the Charleston market, there is no need of commencing until notice has been received of the vessel having arrived in the river below. The shelling of the corn is then commenced, by a shelling machine of immense power, then fanned, next lifted up by elevating machinery, from the first to the fourth story of the house, there measured, and then emptied through a spout into a large flat boat lying in the canal, which, as soon as loaded in bulk, is conveyed along the canal to the vessel. Thus the risk of keeping a large quantity of shelled corn in bulk is avoided, and, by the aid of water, all the operations necessary to load a vessel may be completed in a very short time.

It is not only the main canal that is used for navigation. The "leading ditch," nearly two miles long, which passes through the barn-yard, is made 12 feet wide for that purpose also. When crops are made on that part of the farm, that ditch is flooded by letting in water from the lake, (by a ditch communicating with the lake, and commanding the water by means of a guard gate,) the wide ditch is kept full by closing another gate at its outlet, and the crops of corn or wheat are brought to the barns in flat boats, with comparatively little labor.

There are three barns, or rather houses for holding grain only. Two of them, for corn, are of great size, and constructed with all the care and strength of materials necessary to resist the pressure of the weight of the contents. One of these is 100 feet by 60, and three stories high. The other is 80 feet square, and has 4 floors or stories above ground, two in the body and two in the roof.

It is to me a matter of regret that I cannot see Mr. E. Pettigrew, and acquire something from his store of experience and varied information, and especially as it regards this place, where he has passed his life, from boyhood to old age. He is absent from home. Mr. Pettigrew, the elder, commenced his labors, some 40 years ago, under all the disadvantages of his neighboring proprietor, and with the great additional ones of very limited capital and a small and weak laboring force. Under such circumstances, the extent and value of his drainage, clearing and cultivation and other improvements, are wonderful, and his labors have been as profitable as they are admirable. The general plan of drainage is the same on both estates. Mr. Pettigrew formerly drained into Mr. Collins' canal; but has since constructed his own canal, of 15 feet width, which he uses in like manner both for navigation and for propelling mills and other machinery. He cultivates wheat successfully and on a large scale. As I am informed, he is an excellent manager and cultivator, and, besides his swamp improvement here, he has recently drained and brought under good and productive tillage a large tract of the "body land," and thereby created a fine farm, and an entirely new and rich source of agricultural production. If he who merely makes "two blades of grass to grow where one only grew before" is a benefactor to his country and to mankind, how much greater is his service who drains a swamp, or converts a worthless waste into a fertile farm!

Mr. Charles Pettigrew, the son, was also from home during the first days of my sojourn at Somerset Place. His return however enabled me to give a slight and rapid glance at his father's lake farm, but which was too much hurried by want of time, and also by bad weather, for me to attempt doing justice to its description, and therefore the attempt will not be made. I will merely offer a few notes on some of the most striking objects.

The farm of Mr. E. Pettigrew lies alongside of his neighbor's, and their mansions are not half a mile apart. In both, there is the like position of the buildings near the border of the lake, and the same general plan of drainage. Mr. Pettigrew's main canals being smaller, (15 feet wide) he requires more of them. Accordingly, he has already two, parallel to each other, and together about nine miles in length; and is he about to dig another which will be nearly half as much more. Part of his drained and cleared land was of savanna, as is still the wild land immediately adjacent. The soil of this field is as black, as rich, and seemingly as valuable, as the best swamp. It is now suffering from the access of water from the unreclaimed savanna, which will be remedied by the designed canal. But this land has produced 10 barrels of corn to the acre, and when the remedy is applied, will do so again. The rotation here is the three-shift, without grazing; or 1st year, corn, 2nd, wheat, and 3rd,, the natural weeds, which grow so rankly, (6 to 8 feet high, and very strong,) that the three-horse ploughs, which are used to break up the field for corn, cannot possibly turn them under without a previous operation. This is effected by the "weeding down" process mentioned in his neighbor's practice. The land is kept always in beds of 6 feet width, with deep and clean water-furrows between. The weeds are cut off by broad hoes, and drawn into the water-furrows, and then well covered by the meeting of the first two furrow-slices, made in reversing the beds.

The lake side of both the adjoining farms is alike protected by a low dike. This dike, with the bridges across the canals, forms a continuous road for two miles along Mr. Collins' farm, and apparently as much more along Mr. Pettigrew's. This road keeps near the lake shore, and forms, both by its situation and its decorations, one of the most beautiful and extensive promenades, either for walking or driving, that I have ever known. The road is perfectly level in its course, firm and dry. It is planted throughout on the side from the lake with rows of trees, which are of different sizes according to the date of the clearing of the fields along which they are planted. One of these rows, on Somerset Place, a mile in length, is of tall and noble sycamores, all of the same age and of very equal size. Another very long row of as large sycamores is on Mr. Pettigrew's part of the road. On another part of his, young cypresses have been left where growing naturally, and where deficient set out, on both sides, so as to form an avenue. Between the road and lake is a narrow and irregular margin, under its natural and the usual swamp growth, among which are some trees of very large size, and others as remarkable for their grotesque form.

Neither the road dike nor the margin outside, fringed as it is with trees, could serve as a protection from the violence of the waves, were it not for the shallowness of the lake for several hundred yards from the shore. On this wide shoal the billows are broken, and their violence expended, before they reach the land. Still, were it not for artificial safeguards, there would be yet left enough of power in the dashing of the broken and scattered spray, to produce great changes and do much damage to the land. This is exhibited along the lake shore where the swamp and its forest have not been touched by man. There the deep indentations of water in some parts of the shore, and the ragged points of high swamp, wood-bound and defended, stretching out at other places into the lake—with the monuments of more ancient and extensive devastation and change presented in the position and forms of the old cypresses which stand alone and still living, though far out in the lake, or serve to protect by their roots and spreading base some yet remaining points of swamp—all show the great encroachments which the water has made upon the land. After suffering much damage from much slighter operations of this kind on the drained land, and the most strongly constructed defences having been found insufficient to resist the waves, Mr. Pettigrew discovered a mode both effectual and cheap, and which is used on both estates at every exposed point, or wherever the bank is so low as to need earth to raise it. The means used are "brush-bars," which are formed in the water close to the shore, by merely driving down perpendicularly a double row of small stakes, the rows two or three feet apart, and the stakes as far apart as will serve to hold the limbs of trees, or any rough and small brush laid between the rows and packed down closely, and rising a little above ordinary high water. The whole is made in the roughest and apparently slightest manner. Still this feeble barrier serves not only to prevent the invasion of the water, but to repel it by forming new land. Perfectly clear as the water usually is, its violent action on the bottom in storms renders it muddy; and its sediment is left landward of the brush-bars, in such quantity as to form a considerable though slow accretion to the land by the deposite. It may well be conceived that the obvious and continual operation of the winds and waves for thousands of years may have greatly enlarged the surface of this and other such lakes, while it also increased the elevation of the swamp land on the margins by throwing over them and leaving the earth which had been suspended in the water. The sediment being derived from the bottom of the lake, is doubtless composed principally of such earth as forms the stiff subsoil of the swamp lands. The earth most recently deposited thus by the water has a singular appearance, and shows that the earth must have very peculiar texture and qualities. The fine and fluid mud left in the hollows of the ground behind the brush-bars, after sufficient exposure to dry weather, hardens and cracks, and separates by contraction into numerous pieces of a few inches across. When these pieces are not more than a quarter of an inch thick, they will become curved or curled by the further drying, and in color, shape, and almost in hardness, seem much more like a piece of old shoe-sole, or some other piece of long exposed leather, than earth or soil. After being again wetted by exposure to steady rain for 24 hours, I found these pieces to be softened, and made flexible and somewhat elastic; but they had not lost any thing by the washing of the rain, and hardened as before, by drying. This same earth is found in small pieces, like angular gravel, on the surface and throughout the upper soil of the lands recently brought under cultivation.

No. 8.

The negroes' chapel and religious services. A short lay sermon to the clergy.

Somerset Place, Nov. 26.

If my notes were other than agricultural, or on such matters only as are in some degree connected with agriculture, and if it were ever allowable to speak thus publicly of the private scenes and social habits to which confiding and frank hospitality had afforded free access, I might mention many more subjects presented in the mansion of my host, and the circle of his family and visiters, in strong contrast to the savage wildness of the natural locality, or to the general absence of intelligence and refinement in the surrounding population. Far be it from me to treat of such matters, even though nothing should be uttered but in commendation. But there was one subject of observation which may be made a proper exception to the foregoing rule of conduct, and which offers a lesson of wordly policy, as well as on duties of immeasurably higher importance, to the agriculturists and slave-holders of the south.

On Sunday, the family and visiters designed to attend the performance of the customary public worship at the old neighborhood chapel a few miles without the swamp. But just before the time to set out, rain began to fall, and going abroad was thus prevented. It was therefore that I was invited to attend with the family the service in the negroes' chapel, which Mr. Collins has erected for the use of his slaves. A clergyman of the episcopal church resides here, principally for the purpose of imparting religious instruction to the slaves, but who also officiates at the church in the neighborhood.

The negroes' chapel is a rude and rustic, but neat building, white-washed without and within, and provided comfortably, but in the plainest style, with the accommodations necessary for the congregation, and for its sacred purpose. There is room for 200 persons, and I was told that sometimes it is filled. But at this forenoon service, the house was not half filled, though the number still was as large as country congregations usually are. There was too about the customary proportion of females to the males present, or about thrice as many of the former as of the latter. This alone would have told, if I had not been so informed otherwise, that the attendance of the slaves is altogether voluntary. Every thing is done to invite and persuade, but nothing to compel their attendance. One means, and I should think the most efficient, is that the master and his family regularly make part of the congregation, when not at the more public chapel, and they participate fully in the services, and acts of worship.

The clergyman being engaged abroad, as always at the forenoon service, his place was supplied by another member of the family, who is licensed as a lay reader, and is also a candidate for the ministry. The service was according to the episcopal form; and never on any other occasion has it appeared to me more impressive.

In the evening, the congregation again assembled for a still more solemn service. The black audience was much larger than before, but still composed only of slaves belonging to this and the adjoining farm. The bishop of North Carolina was a visiter of the family, and his presence, I presume, had induced this appointment for administering the sacrament. He was present in his episcopal robes, and after the ordinary service, performed by the resident clergyman, the bishop delivered an address on the service about to be performed, equally and admirably suited to the dignity of the subject, and to the humble powers of comprehension of the greater number of his hearers. The officiating priest then administered the sacrament to all the communicants present, including the bishop, the master and several of his family, and about thirty of the slaves.

It was the first time that I had ever been an attentive witness to the performance of this solemn ceremony; of course I am altogether unworthy to appreciate it, and unfitted even to describe it. But never have I elsewhere been so strongly impressed by any religious service, or by any pulpit eloquence, as by the unostentatious ceremonial of this humble house of worship. Nor have I ever before had so forcibly urged upon my understanding and sense of duty, what we owe for affording the means of religious instruction to our slaves, and the high importance, and the excellent effects as here proved, of such instruction.

Why is it that, by the many who have undertaken the sacred duties of preaching the gospel, and laboring for the salvation of souls, so few and such feeble efforts have been made to give religious instruction to our slaves? The excuse which I have heard made, in answer to this question, is, that the owners of slaves might probably view any such efforts with suspicion, or perhaps meet them with hostility. As a slave-holder, and one professing to know something of my fellow slave-holders, I pronounce that there is no ground for such an opinion, or excuse. The assertion of the existence of any such general, or considerable opposition, shows either gross ignorance, or otherwise is a foul slander, for which there is not a semblance of foundation. And even if there were some few narrow-minded slave-holders who would object to such advantages being offered to their slaves, is that any reason or excuse, for one who assumes to be a minister and messenger of God, to withhold his instructions from those slaves whose masters would receive them with welcome and thankfulness?

It is a fact universally admitted, and deplored by all considerate persons, whether christians or not, that throughout lower Virginia, the ministers of the gospel, of all denominations, are very few, and their usual congregations, or number of hearers, very small. Still there are many such persons who are passing their lives and complying, as they think, with their holy calling and vows, in regularly preaching once a week to a few dozens of hearers. Yet if these preachers deemed it their duty to labor as much for the salvation of blacks as of whites, there is scarcely one of them so situated that he could not easily find hundreds to instruct, who, unless so sought and invited, will perhaps never hear his voice, and certainly not profit by his ordinary and public ministerial services. Nay, there is scarcely one of these country ministers who at his very place of residence, or temporary sojourn, could not assemble an audience of slaves belonging to the farm, of greater number than he usually can collect of whites from all the neighborhood. And if any true zeal were felt and manifested for so excellent an object, ministers would find very many slave-holders, and even irreligious slave-holders, who would not only permit the performance of these truly apostolic labors, but would rejoice to have them performed, and (what I fear is more to the purpose,) would also be willing to *pay* for the performance.

If the owner of a hundred slaves, or a hundred thousand dollars, shows any disposition to receive religious instruction, what assiduous care, what devoted zeal, will not be shown for his eternal welfare! But while the greater part of the time and all the ability and power of persuasion of a minister would be willingly devoted to clear away the darkness, and strengthen the feeble striving, of such a penitent, and to aid his novitiate in a better course of life, his numerous and ignorant slaves, on the same ground and perfectly accessible to the preacher, would be scarcely thought of by him, and would derive no benefit whatever from his presence!

If an inference were to be drawn from the general course of procedure only, or of omission and neglect in this respect, by the greater number of those who have undertaken to perform all such duties, and who claim the sacred character of God's ministers, and messengers of salvation to all sinners—(and if in no degree corrected by the knowledge of any such meritorious and admirable exception as was described above—) the inference would be, either that it was a general article of belief among christian preachers that negroes had no souls to be lost or saved, or, if otherwise, that the souls of a hundred poor slaves were of less value, and had less claim upon their spiritual care, than that of a single individual of elevated grade in society.

No. 9.

The Belgrade farm. A corrected view of the "body land."

Nov. 28, 1839.

Having postponed my departure to the latest day that the claims of my business at home would permit, on the 27th I left Somerset Place to take passage in the steamboat at Plymouth at night, and to proceed homeward as rapidly as I could be conveyed by the several connected lines of steam navigation and railways. Mr. Pettigrew the elder had arrived at his Belgrade farm (7 miles from the lake,) the evening before, and had sent me so kind and urgent an invitation to call on him the next morning, that I could not do otherwise, although there would be less than three hours to stop there. The short time so given was spent in conversation which was necessarily very hurried, and at the same time walking rapidly over the farm and taking a glance at its condition and improvements; and thus at the same time giving sufficient employment to our eyes, feet, and tongues. But however gratifying it was to me, even in so hurried a manner, to make the personal acquaintance, and listen to the interesting remarks of Mr. Pettigrew, the opportunity was altogether insufficient for me to gather either, by observation or other mode of information, any thing in detail, to which I could do justice in reporting. I have requested, and hope the request may not be slighted, that Mr. Pettigrew will hereafter furnish me in writing something of what I had not time to obtain by personal inquiry and observation.

The weather was very cold for the season and latitude. The earth everywhere in the shade was hard frozen, and in the sun-shine the surface had just thawed, and of course was wet and adhesive. Both these conditions were as unfavorable as possible to the exhibition of the characters of the soil. Still, it required but a few minutes' observation to show me that I had been totally mistaken in my earlier opinion as to the nature and constitution of the "body land," formed upon merely travelling over another part which is in very inferior condition. Merely from the appearance of the surface on which I walked, and still more from the deeper soil and subsoil exposed in Mr. Pettigrew's ditches, I would have been convinced that this "body land" is not a clay soil proper, nor naturally a firm or high-land soil of any kind, but that this also is of swamp formation, though greatly and for a long time altered by the operation of natural causes. The whole surface is even more level than the existing swamps in general; so much so, that from one part of the tract which I saw, the surface water formerly and naturally was discharged towards every side, to seek outlets in different streams. The new artificial discharge by deep ditches is directed just as convenience requires, and might be made without much additional difficulty towards any point of direction.

The general plan of drainage is the same as that used at the lake, by drains of different sizes crossing each other at right-angles, and the smaller emptying into the next larger. The water-furrows between the narrow beds may be considered as the smallest drains, which first gather and discharge the surplus rain or surface water, though merely made by the plough in the ordinary course of tillage; and the ten-foot ditches are the largest, and ultimate receivers which pass through the fields, and the fifteen-foot canal without, into which all the water is discharged, and thence into Scuppernong river. The main canal also serves for navigation for delivering the crops. Indeed, as every such main canal must connect with a navigable river, there must be the means of intercourse by navigation between every two properly drained farms in this part of the country.

The soil and subsoil, though, as stated above, apparently of swamp formation, have no resemblance to any of the drained swamp near the lake. The "body land" in its forest state, has no cypress or other aquatic trees, but has a considerable proportion of large oaks, intermixed with poplars, sweet-gum, beech, and other trees usually found on rich and low or alluvial, but yet firm and usually dry lands. Nature and time seem to have produced here such a change as may be supposed would take place in the great swamp, by its being relieved from superabundant water for the duration of some thousands of years. The upper soil being principally of vegetable material, would, in the course of time, rot down to a state of finely decomposed parts, and close texture; while the former forest of cypresses would die and give place to trees preferring dryer soil. Such seems to be just the natural state of the Belgrade land, and I presume it was that of the great "body" of which it forms a part. And for just such a change of natural circumstances to be made, it is only necessary to suppose that Scuppernong river, the present great outlet, was formerly so obstructed that the level of the back water was kept several feet higher than its present elevation.

The ditching of Mr. Pettigrew has been executed in the best manner, and his labors of cultivation seem to be scarcely inferior. The soil, though so stiff as to be best suited for wheat, yet will bring as heavy average crops of corn as any known in this country. I saw a field of 40 acres, from which had been measured a crop of 10 barrels average to the acre, and part of which probably brought 11 or 12 barrels, as another part fell much below the general average.

The supposed ancient change of this land, from its still more ancient condition of a swamp saturated or overflowed by water, is my own hasty speculation, and which I should not leave it to be inferred that Mr. Pettigrew is responsible for. But some interesting facts, of which he informed me, go far to sustain the supposition. In his now cultivated fields there were several shallow ponds, varying from half an acre to two acres in extent. After these places had been laid dry by ditches, and brought under cultivation, by digging into the soil, charcoal and ashes were found, showing conclusively that these depressions had been made by the burning of the earth to that depth, such as occurs to some extent in the great swamp, and especially the savannas, in every very dry season.

Next, as to the extent of operation of such action as might have lowered or consumed the surface and consolidated the soil of a swamp when relieved of its former overflowing water. Mr. Pettigrew told me that in the years 1805 and 6, the longest and greatest season of drought which he has had experience or report of, the great swamp was dry for 18 months together, and the water of the lake sunk 4 feet below its highest mark of a full head. During this long time, fires were continually raging in some parts of the swamp, and even passed over the same parts more than once in the time, as the state of dryness increased, and the combustible material was thereby deepened. In a particular part of the land adjoining Mr. Collins' canal, which was before described as being now covered with laurel trees, Mr. Pettigrew knew that the soil continued slowly burning for 12 months together. When at last the rains again saturated the swamp, and the superabundant water flowed thence into the lake, the water of the lake was at first so deeply colored as to stain cloth that was washed in it, and it was feared that its previous quality was lost forever. But this condition was merely transient; and it was not long before the water was restored to the state of purity which it had before, and has since retained.

And now I have to bid farewell to the swamps. And if I may venture to imitate the manner used by old Fuller in his different "farewells" to the counties of England, after discoursing of their "worthies" and their peculiarities, my farewell would be of this fashion:

May the proprietors of the great swamp region, who are poor, copy the untiring industry and "indomitable perseverance" (to use his neighbor's words,) of the older of the two lake-side proprietors; and may the rich copy the liberal and judicious expenditures, and the enterprise of the younger; and may all profit by the intelligence and foresight, and enjoy the success, of both of them. May the swamp waters be diverted from their present operation of drowning land, and destroying fertility, health, and life, to the conveying the richest and most abundant of new products to good markets; may the soil be changed from being the poisoner of thousands, to be the feeder of millions. May the people of the good commonwealth of North Carolina acquire and maintain the energy requisite for these and other great works to make useful the now obstructed and dormant but mighty resources of the state; and may their government possess the wisdom and sound discretion which may safely direct the good work.

LEGISLATIVE AID TO AGRICULTURE.

Extract from Gov. Noble's Message to the Legislature of South Carolina.

In giving you "information of the condition of the state," I should feel that I was justly obnoxious to the charge of neglecting one of the most important branches of industry, were I to be silent on the subject of agriculture. This pursuit of the great mass of the people has claims upon your fostering care and attention. It is the source of our wealth and power, and furnishes the means of our commercial exchanges. Yet its importance seems never to have been realized by the constituted authorities of the state; for it is a lamentable truth, that while other branches of industry have received an impulse by wholesome laws, the great interests of agriculture have been passed by, almost with silent contempt. It is now time for the state to dismiss from her counsels this cold indifference, and to take such action on the subject as will promote its success. In exploring the causes which have retarded the progress of the state in population, wealth, and importance, none is more prominent than the utter neglect of this primary pursuit. It cannot be doubted that South Carolina once possessed a soil of unsurpassed fertility. But this rich gift of a kind Providence has been, in a great measure, lost, by a most pernicious course of husbandry. A large portion of this once flourishing region, blessed, too, with a propitious climate, has been reduced to sterility. Yet, all hope of reclaiming and restoring to its wonted productiveness, our exhausted soil, is not in vain. It is a beneficent provision of a good Providence, that beneath the surface of the earth are to be found substances of the most fertilizing qualities. Their discovery, however, requires the application of science, and means seldom possed by individuals. It is in such a case, that a wise and patriotic legislature should extend its aid. But to subserve fully the interest of agriculture, the legislature should not confine its operations to a geological survey alone. With this should be connected an agricultural survey. While the former would bring us acquainted with all the substances which enter into the composition of that portion of the earth to which we can have access, the latter will elicit a mass of information in relation to every thing that concerns agriculture, which cannot fail to be highly useful. In other countries, the utility of agricultural surveys has been fully proved, by the valuable results. But, in carrying into effect such surveys as have been mentioned, the value of the results would depend upon the selection of an individual possessing the highest qualifications, combining a profound knowledge of the subjects of investigation, a sound discriminating judgment, and an untiring zeal and industry. The expense of such a project, should not be weighed against the incalculable importance of the end proposed. Being deeply impressed with the practical usefulness of such surveys, I earnestly recommend that you provide for their accomplishment.

AN EXTENSIVE PIGGERY.

From the Farmers Monthly Visiter.

We visited one establishment near the Spy pond in West Cambrige which will be thought remarkable; it was on ground very near the precise spot where, in company with a grandmother and some elder female cousins, at the early age of five or six years, all of us got lost and wandered in terror late in the afternoon, in a swamp of the high blue-berry bushes. It is now a place for hogs, where no less than nine hundred of these animals, from the smallest size to the lusty two-year-old weighing eight hundred to a thousand pounds, are kept. And how will the reader suppose so many devourers could be sustained pent up in a pen of not more than one or two acres, without starving? It is in this wise:—Some five or six years ago the proprietor of this hog establishment engaged to pay the municipality of the city of Boston twenty-five hundred dollars a year for the delivery on the spot of the offal collected from the kitchens of the several families in the city who had not other means of disposing of it. This offal was fed out daily to as many swine as it would keep. The first contract of two or more years turned out to be of great profit to the proprietor. A second contract was made, and the sum was advanced to thirty-five hundred dollars a year, and the proprietor is taxed a further sum of about five hundred dollars a year for tolls, as he is compelled to pass out of the city over Cragie's toll bridge, the town authorities of Charlestown not permitting the offensive matter to be brought over the Warren free bridge, which leads directly through the compact or city part of the town. With the increased expense, the proprietor has made his thousands every year. The feeding is said to be equal to the rearing of one thousand hogs in a year, weighing three hundred pounds each. The hogs are taken from this feed and fed on corn a few days before they are slaughtered for the market, so that the most astute pork eaters cannot possibly distinguish between the meat of these and the best family-kept hogs of the country. If the keeping was all the cost, at the high price of ten cents the pound, which has been the lowest price for pork in the market, the income would be thirty thousand dollars a year. The price of pork, now reduced as it is to six cents the pound, will still furnish a grand profit to the owner of the West Cambridge piggery.

The profit on the hogs is not the only gain of the establishment. The manure here made has had the effect to double the value of the land all around it, to the distance of half a mile or a mile. Six large wagon loads of offal, containing, with much that is offensive, much of the best living of the luxurious livers of Boston; remnants of roast turkeys, roast beef and plum-puddings, with now and then a silver spoon and fork, are daily brought to the piggery. They are spread at three different times in the day over a large plank platform on which the animals feed. Six farmers of the town contract daily at the price of two dollars and a half per day for the leavings upon the platform, each taking his turn on a different day of the week (Sundays excepted) in filling a large wagon such as every considerable farmer owns, and appropriates almost exclusively for transporting his cord of manure wherever he can find it. The pine plains supplied with this manure—the steril ground that formerly produced little or nothing—yields such crops of rich garden vegetables as no one previously acquainted with them ever dreamed he should there see grow.

Among the practical operators on the land in West Cambridge, without asking of them we take the liberty to use a few names, not because others may not be their equals, but because they happen to have fallen more particularly under our observation at the time of our recent visit.

PENNSYLVANIA FARMING.

For the Farmers' Register.

In the months of August and September, I was several weeks in Pennsylvania, and passed through several counties, east of the north mountain; having no speculation in view, either in lands, or mulberries, I was studious in examining the character of the soil, and the course and method of their cultivation. The lands in all the counties I was in, are naturally fertile, with the exception of Adams; they vary, as with us, in quality, in the same neighborhoods, though they have been much equalized by the hand of persevering industry. I found on soils abounding in slate stone, good corn, and excellent grass. They are untiring in improving; their principal agents are lime, and the putrescent manures, which they collect on their farms, and do not much heed the notions of chemical combinations. I was for several days at the house of a farmer, who not having a sufficient quantity of putrescent manure to cover a field he was preparing for wheat, purposed to send to the city, at the distance of eighteen miles, for bone dust to complete it. He was not one of those who having determined upon a project, accomplished it at any cost; but a plain practical man, who had advanced his fortunes by industry and economy.

I learn by a paper in the "American Farmer," that the late president of the Bank of the United States, has retired to the banks of the Delaware, and devotes his time and his talents to rural pursuits; that by means of a steam power and a tank, he has accomplished for himself what the philosopher of the Nile supposed he had achieved for Egypt by the power of the stars. This I suppose may be properly called elegant agriculture, and like many other elegant arts, of no great value to any but the projector; no doubt the artificial showers of Mr. Biddle, and the beautiful rainbows they produce, has excited the wonderment of many a Chestnut street lounger.

Farmers have reason to admire the magic powers of Mr. B. displayed on the banks of the Delaware. Though few of them will get a taste of the fine grapes, they all participate in a depreciated currency, which they find a wormwood dose, and most of them have a cause to regret that he abandoned "the bank parlor" for "the groves of Andalusia;" had he remained at his post, the fine vigorous institution, which sprung like a Phenix from the ashes of its parent, would never have fallen upon the desperate projects of a ruined speculator.

The rotation of crops is a matter unsettled in Maryland and Virginia, and I was desirous to ascertain the most approved, in Pennsylvania, but found they had no regular system; so long as a field produces a good crop of grass, they are reluctant to break it. Formerly on the turnpikes which were established in every section of the country, a large demand for provisions for man and beast was made; wherever the rail-roads run, this is at an end. The car passengers make but one meal between Harrisburgh and Philadelphia, a distance more than one hundred miles. They fatten many cattle and sheep which are sold in the cities; but the loss of the domestic market has been sensibly felt, and will probably lead to a more extensive cultivation of grain. That rail-roads are a most beneficial improvement for travel, all must agree; and it is probable, on the great routes, will be found profitable to the companies; but it may be well doubted if they can advantageously compete with navigable rivers, navigable canals, or well constructed turnpikes, for the transportation of heavy articles. The Philadelphia and Columbia Rail-Road has been but a few years in operation, and has carried very heavy burdens, from the Susquehanna. It is now in a shattered condition, and requires heavy repairs, which must continue to recur, unless a more stable mode of construction shall be discovered.

In comparing the improved lands of Pennsylvania, with the improved lands, or such as may be improved on the Chesapeake Bay, each have their peculiar advantages. For the latter I should claim the advantages of transportation. I think where lands are equally improved, those of Pennsylvania will afford the highest product of wheat, and those on the Chesapeake Bay of Indian corn. We are a little too far to the south for the perfect maturation of wheat, and they to the north for Indian corn. They will not have this year a full crop of Indian corn, in consequence of the cool summer, which will occasion no diminution here. Our wheat, unless thrashed out early, is sometimes greatly injured by the weevil fly; they can keep theirs in the straw 'till winter without danger. By a heavy drought in mid-summer, our grass suffers most, but it springs earlier and grows later. In the marl region, we can apply calcareous manure at less cost. In Chester county, lime at the kiln costs ten cents per bushel; and to those who have the stone on their own farms, preparing it is equal to eight. Their expenses on agricultural implements greatly exceed ours; on account of the stone which pervades the country, they require to be much heavier than ours, and soon wear out; their horses cannot plough a day without shoes. A farmer who held a farm of one hundred and seventy acres, told me his blacksmith's bill exceeds annually $100. In fruit and vegetables our advantages are decided, they can grow none which do not succeed here. On the west side of the Delaware, except in very favorable situations, those who indulge in the luxury of peaches, water-melons, and sweet potatoes, get them from the city. With regard to manual labor, I could form no decided opinion. The wages there are very high; but they can call on laborers at pleasure, and discharge them when the work is done. Many of the readers of the Register can estimate the yearly cost of a large family of domestic slaves, who are treated with kindness and humanity. They have eaten out many a fair estate; and I think there was more correctness in the apothegm of the late John Randolph, "that many southern gentlemen hold their lands in trust for their negroes," than is usually admitted.

RUSTICUS.

E. S., Md., 15th Nov., 1839.

REV. D. V. MCLEAN'S EXPERIMENTS IN SILK CULTURE.

From the Journal of the American Silk Society

[We have much pleasure in laying before the public the following paper from the Rev. D. V. McLean, of Freehold, New Jersey. It was prepared, as it purports, to be laid before the executive committee of the American Silk Society at the annual meeting, in Washington, on the 11th of December; but it was deemed advisable to publish it in anticipation of the meeting, for two conclusive reasons—first, that a printed copy of it might be put into the hands of every number of the society promptly; and, secondly, that the invaluable matter it contains might be as speedily as possible diffused over the whole country. We earnestly ask the attention of every person friendly to the cause of this valuable paper, and especially do we ask of the editors of newspapers to give it free circulation in their columns. Those editors who are anxious to publish correct information on the subject, have a paper now that cannot fail to answer their purpose. It contains the result of *actual practice*, by a gentleman whose *greatest* fault, if fault it be, consists rather in under-rating than in over-estimating the profits of the business. We hope that this paper will be read by every man and woman in the United States, and that it will receive the full confidence of all—to which it is richly entitled.—Ed. Jour. S. S.]

To the Executive Committee of the American Silk Society.

During the past four years I have watched with deep interest the progress of the silk culture in our country; and actuated, I trust, by a sincere desire to awaken an interest in the community in regard to a branch of business, by which I verily believe thousands in our land might acquire an honorable and comfortable subsistence, I have labored to test both the practicability and profit of the culture of silk. Last year my experiment went no farther than the production of the cocoons—and though the results were highly encouraging, they were not fully satisfactory to my own mind.* This year I determined to go a step farther, and produce the reeled silk, ready for market. The offer of premiums by your noble society, was undoubtedly a wise measure. This will induce more accurate experiments—and experiments in different parts of our country, and under different circumstances, the result of which will enable the committee to diffuse valuable information, on which the community may rely. You will please to consider me a competitor for the premiums for the greatest quantity of merchantable raw silk produced from the quarter of an acre.

The weight of the silk in the case which accompanies this paper, is *twelve pounds*, sixteen ounces to the pound, and is the product of *one quarter of an acre*.

The soil on which my trees were grown is a heavy clay—three or four years ago, the land would not have produced 20 bushels of corn to the acre. The two previous seasons, the lot on which my experiment was made had been very moderately manured—the present season it was covered with what might be considered a good coat of marl and barn-yard manure mixed.

The 20th to the 23d of April last, I planted a half acre lot with morus multicaulis roots, cuttings, and layers. The roots were of the previous season's growth, taken from trees that did not exceed 2½ feet. The top was cut of within two inches of the root, and the roots were laid horizontally in the row, about ten inches apart. The cuttings were from the tops of these trees, with one bud to each, and were planted six inches apart in the rows. The layers were small trees, six to eighteen inches long, and were laid continuously in the row—the root of one touching the top of another. The rows were 2½ feet apart. The length of the lot, as planted in trees, is 288 feet, and the width 75 feet. I expected to have had roots sufficient to plant half of this lot, or a quarter of an acre; they planted, however, only 26 feet in width, and 288 in length. In making out my quarter of an acre, therefore, I was obliged to include eleven feet and eight inches in width from the layers; so that the dimensions of the lot was 286 feet in length, and 37 feet 8 inches in width.

I regretted that I had not roots for the whole quarter of an acre, as the roots afforded much more leaves than the layers. Owing to close planting and the nature of the soil, the trees produced were small—say an average of three and a half feet. The present growth on the quarter of an acre does not exceed 5,500, all counted, large and small.

My cocoonery is 36 by 18 feet, 2 stories high. I feed almost entirely in the second story. There are two tiers of shelves, three feet wide by twenty-four feet long—the shelves rise one above another—one foot apart, seven shelves in each tier. The second story contains 13 glass windows, with Venitian blinds. My eggs were of my own producing the previous season. They were saved with great care from my best cocoons, on muslin, the pieces of muslin rolled up in the fall, or soon after the eggs were laid, and placed in a common farm bag, and this was hung to a beam in the cellar. In March the muslins were folded up and laid one on top of another in a small tea chest lined with lead, this was placed in another of the same kind, but a little larger; and the space between the two was filled with pulverized charcoal. Then a few thicknesses of old flannel was laid loosely over the top of the smaller chest, and a loose board laid over the larger. Then the whole was set in a still larger rough box, with a loose board on the top, and this was put down in the ice house, so that the ice surrounded the sides of the box. In the inner tea chest was a thermometer—the box was examined every week, and the thermometer was not allowed to rise above 45° Fahrenheit. I am thus particular as to the mode of preserving eggs which has succeeded so well with me, because so much disappointment has been experienced in regard to eggs. Other modes equally good may doubtless be adopted for retarding the eggs; the above plan, however, succeeded with me to admiration; the last hatching the 27th of August, was as perfect as the first. This year I saved my eggs with even greater care than last, and am preserving them in the same way; and I cannot but recommend others to preserve them as above, unless they have actually tried some other mode which has proved equally good.

July 18th, I hatched some two or three thousand mammoth white. July 26, five or six thousand sulphur. July 31, two or three thousand sulphur. August 19th, over 20,000 sulphur—and August 27th, hatched the last, say 5 to 8,000, sulphur. The mammoth white worms wound in 24 to 26 days—the sulphur 28 to 33 days. A few lingered to 36 or 40 days.

Green oak bushes were used for the worms to wind in. Last year I had plasterers' lath fastened under the shelves, one and a-half inches a part. I found difficulty, however, in getting the worms to ascend well. This season I used straw at first, tied up in small bundles and set on the shelves, but this did not answer as well as I had been led to expect. At length I threw every thing aside and took the oak bushes. These have succeeded with me better than any other contrivance. They seem *natural* to the worms, and I have never seen them mount any thing so readily as green bushes.

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* See the report of this experiment at page 85 vol. vii. Far Reg.

and I see not why they may not be used in preference to any other fixtures for winding. They cost nothing, except the labor of procuring them from the woods and placing them on the shelves. The only objection I see to them is, the cocoons cannot be taken from the bushes with quite the same facility with which they may be removed from straw or some other fixtures. Yet I do not believe, this will be found a matter of much moment. A little more experience, gathered from differed sections of the country will enable us to adopt the most approved plan for winding. Of the mammoth white cocoons it required an *average* of 317 to the lb., weighed just as taken from the *shelves*; of the sulphur it required 300. 288 of the largest white made one lb., and of the largest sulphur 247. The committee will perceive from this statement that the weight of my cocoons falls far below that of those produced by many other gentlemen, in different parts of our country, notices of which have appeared in the Journal of your society and elsewhere. Why this inferiority I cannot tell. The worms were fed on the shelves without hurdles, and the litter was removed from the shelves about every fourth day. Sometimes they went from one moulting to another without having the shelves cleaned. The shelves were cleaned without hurdles in the following manner. The attendant had a thin half inch board, planed smooth, 18 by 24 inches. After the worms appeared to be through their moulting, fresh leaves were given them, the attendant took up these leaves, the worms adhering, and laid them on the board which she held in her hand and thus removed them to clean shelves; if all did not attach to the first leaves, others were strewed on, and generally the second time going over all were removed. I know this mode of operations does not meet with favor among those who are for adopting the "high pressure rail road system." Nevertheless with my present experience, one year with, and another without hurdles, this is the plan I would adopt in future, at least until I am further enlightened. Many objections may be urged against hurdles. They are expensive. Hurdles to feed 1,000,000 of worms will cost several hundred dollars. This expense, is by no means counterbalanced by the labor which they will save; for it admits of doubt whether, after all, there is much labor saved. The worms *will not all* ascend on the fresh hurdles, and if the policy of throwing away all that *do not ascend* readily, is adopted, probably one-half the worms will be thrown away. If this is not done, leaves must be thrown on after the hurdles are removed, and the worms must be taken off as they are without the hurdles. Another objection is the difficulty of preventing the worms from winding under the hurdles, and around them among the litter. Besides the plan of feeding without hurdles is much more simple, and on this account to be recommended to the great mass of persons who will feed. My worms were fed as often during the day as they needed it; say five or six times; they were *never* fed at night. During the whole time of feeding, the weather was very variable, the thermometer ranged from 60° to 90°, with frequent easterly storms of several days continuance; one storm lasted eight days, from August 16th to August 23d, inclusive. Several storms were accompanied with severe thunder and lightning. August 13th, a barn was struck with lightning and burnt to the ground, less than one hundred yards from the cocoonery. The worms appeared to experience no injury whatever from the thunder. The damp wet weather undoubtedly retarded them in their operations. At such times they were not so vigorous and active, but every crop was perfectly healthy; few, if any, were lost the whole season by disease. At one time my shelves were more crowded than they should have been, and worms would frequently fall to the floor. These seldom wound after they were returned to the shelves; in this way I may have lost nearly or quite the amount of one lb. of reeled silk.

In order to be prepared for cold wet weather, I fitted up a furnace in my cellar with flues leading up and around my upper room. I did not use artificial heat, however, more than a few times when the mornings were a little cool. Here I will take occasion to remark that the plan of artificial heat, and of regulating the temperature of the cocoonery by the thermometer is, I believe, entirely unnecessary. If it *is* essential, success in the silk culture is impracticable. All our writers on the subject maintain that our climate is admirably adapted to the silk worm *without* artificial heat, and I believe it is. Multitudes who we hope will make silk, never saw a thermometer, and if they are taught, that in order to make silk they must have cellars and furnaces, and flues, and thermometers, it will be in vain to attempt to get them at the business. The more simple and cheap every thing is made, connected with the production of silk the sooner will the culture be established in our country.

The whole number of worms fed on my quarter of an acre was about 40,000. The weight of leaves which they consumed was 2,576 lbs. The amount of cocoons produced was 130 lbs. weighed just as taken from the shelves without sorting or flossing. After they were sorted and flossed, there was one lb. of floss and four lbs. defective cocoons, leaving 126 lbs. of cocoons. These produced 12 lbs. of merchantable reeled silk, 16 ounces to the lb., and one lb. wastage, ends, &c. The silk was reeled on the Piedmontese reel, the water heated in kettles set in a furnace, one kettle was used as a heater, and the other to reel from.

From the above statement it will be seen that it required between 19 and 20 lbs. of leaves to make one lb. of cocoons. Of these cocoons, without flossing or sorting it required 10 lbs. and 10 ozs. to make one lb. of reeled silk. After they were flossed and sorted, it required 10 lbs. and 5 ozs., or about 214 to 215 lbs. of leaves to make one lb. of reeled silk. This shows a greater amount of leaves necessary to make one lb. of cocoons, and a greater weight of cocoons necessary to make one lb. of reeled silk, than the estimates published in various quarters, and greater than experiments said to have been made actually required. All I can say is, the object of my experiment was to arrive at *facts*, and the above is a plain statement of facts as they occurred in my experience. I am free to state, that even with your very liberal premiums in view, my object was not so much to see the *very largest* amount of silk which could be obtained from the smallest quantity of leaves, or to endeavor to reach the *very maximum* which could under the most favorable circumstances be produced from the quarter of an acre, as to make what might be termed a *medium*, or *average* experiment; to feed just as I supposed the great mass of persons engaging in the silk business would feed. I was often obliged to feed *wet* leaves, owing to the frequent long storms, and the worms appeared to experience no injury whatever from this. Still I did not consider it safe to feed leaves gathered in the storm, and dripping wet; and in our attempts to dry the leaves, some became wilted and were thrown away. The worms also were always abundantly fed, and a partial waste of leaves frequently no doubt occurred in this way. These things, together with the loss of perhaps the value of near one lb. of reeled silk, by worms falling from the shelves, would vary the result a little, and *might* show that 190 lbs. of leaves would produce one lb. of reeled silk.

I do not doubt, but that under the most favorable circumstances a few lbs. of cocoons might be produced on 10 or 12 lbs. of leaves to the lb. of cocoons. Nor do I doubt that one lb. of reeled silk may be produced from 8 lbs. of cocoons, or even less. Much depends on the quality of the cocoons, and more on the time when they are weighed, whether in a fresh and green, or entirely dry state. I could have selected from my lot, even in a fresh state, 8 lbs. of cocoons, which would, beyond all question, have produced one lb. of reeled silk—but this would be no test of the profit of the business. The public do not wish to know so much the very maximum that can be made, as what may be regarded *an ordinary standard* for every prudent farmer—and I am now perfectly, persuaded, from two years experienced that I am not greatly mistaken.

Last year I produced at the rate of 510 lbs. of cocoons to the acre—*this* year I produced at the rate of 520—and my deliberate opinion is, that more will fall below this standard than will exceed it—and in *one* case, where a less quantity of leaves will give the above quantity of silk, *two* cases will occur that will require a greater.

Most happy will I be, and greatly will it be for the interest of the community, if it shall be found on farther experience that 80 or 100 lbs. of leaves will make one lb. of reeled silk instead of 214 or 215, as required in my experiment, for my quarter of an acre did produce 2,576 lbs. of leaves, and the trees were not stripped remarkably close either—then the amount of reeled silk per acre would be the handsome yield of 104 to 128 lbs!! A result; albeit, which I frankly state, I utterly despair of seeing realized.

I have read with great regret many of the calculations of the day on the subject of silk profits—some of them, I greatly fear, are made purely to subserve *selfish* ends—regardless of the ultimate consequences to the public. Others are undoubtedly honest, but they are, I fear too often the results which are *wished*, and *desired*, rather than those which have *actually been realized*.

It is not the best way to produce conviction in the minds of men, on a subject like this, to *assume* facts, and then reason very dogmatically in regard to what *may* be done, and what the *calculator* will do *next* year, or even to take some *very fortunate* experiment made on a *very small* scale, and then infer, because *one cocoon* will weigh so many *grains*, then 1,000,000 will produce so many lbs.; or because one tree will yield one lb. of leaves the first year, and 100 lbs. of leaves will make one lb. of reeled silk—and 10,000 trees will grow on an acre—therefore, an acre will produce 100 lbs. of reeled silk the first year—or because the 120th part of an acre will produce so much—then a plantation of ten hundred and twenty acres will produce *so much*. I am pleased to see experiments made with all the accuracy imaginable, even on the smallest scale—good may result from them—but they are no safe guide for the practical man who is about to embark in a new business. I regard that experiment in this stage of the silk culture in our country, as valuable, when it is made from a lot *sufficiently large*—when this lot is in an *average* state of cultivation, and when the cocoons may be considered of an *average* quality. Then, if this shows a reasonable profit, it will accomplish more than *whole volumes of calculation*, or numberless very small experiments. The quantity of land named by the committee I regard as sufficiently small for any satisfactory results—and should they continue the liberal policy of offering premiums the following year, I would respectfully suggest whether the quantity of land from which the experiment is made, ought not to be increased.

But to recur to the matter of profit. The above shews us 48 lbs. of reeled silk, 16 oz. to the lb. as the product of an acre. If this is worth, as I understand it now is, $6 per lb. then the gross proceeds of an acre will be $288. The first year, let it be remembered. Or if it should be worth but $4.50 per lb. which is undoubtedly the safest price at which to rate it, the gross proceeds of an acre will then be $216.

In regard to the cost of production, it is confidently *asserted* by many, that it can be produced for $2 per lb. Mine cost me much more than this. My experience, however, satisfies me that it can be produced for $2.25 per lb. and I incline to the belief that it *may* be produced for $2. Produced on the farm in a small way, the cost will be next to nothing—the whole product will be clear gain. Now take the product of an acre as above stated, at $288, and allow this to be made at an expense of $2 per lb. you have a net profit of $192 per acre!! Allow the cost of production to be $2.25, and you still have a net profit of $180. Again—take the product at $216, (allowing the silk to be worth only $4.50 per lb.) and let the cost of production be $2, it gives a net profit of $120 per acre; but allow the cost of production to be $2.25 per lb.—the sum at which *I know it can* be made—and it still affords us a net profit of $108. This last, I am persuaded, will be found more nearly to correspond with actual results. If the price of the silk is *more* than $4.50 per lb. and the cost of production less than $2.25, so much the better for the culturist. But the above results, very nearly, are produced in another way. The amount of help necessary to attend to one acre, or to 160,000 worms, would not exceed the value of two females, 12 weeks each, and one male, the same time—indeed; I do not believe it would require so much help—but admitting it should, the maximum *average* value of this help would be *here*, $3 per week, including boarding—that is then the cost of producing 48 lbs. of silk, would be $108. And the value of that silk being as above stated $288, the net profit would be $180!! Or the value being only $4.50 per lb.; or the gross amount of $216, still the net profit would be $108 per acre—exactly the result before stated—and this, let it be observed, is just $4 more than the result shewn by my experiment of last year. I believe, therefore, I have demonstrated, not by *figures* and on *paper* only, but by the *actual production* of the silk, that every prudent culturist may *safely* rely on realizing a net profit of *at least* $108, the first year, or $180 while the price of raw silk continues what it now is. And I ask, is not this sufficient? ought not any reasonable man to be satisfied with this? I wish, indeed, I could have made the profits a *little* larger, but I *could not do it.* Other gentlemen, in our country, with their enormously large cocoons, may have been more successful, and may have had practical results more nearly answering the calculations usually made. Suppose I had taken my 120 lbs. of cocoons, and had selected 8 lbs. of the *firmest and best*, and had reeled these, and no more, and the result had been, as I have no doubt it would, 1 lb. of reeled silk, and then had put forth my statement, saying, "if I had reeled *all*, and all had yielded as well as these actually reeled, *then* I would have had 64 lbs. per acre!"—thus increasing the profits in this convenient way more than one quarter! would not this be deceptive, and would it not be calculated to mislead? Now, however, there is no room for deception—all was actually reeled, and is exhibited to the public.

But I fear my anxiety to exhibit this whole subject before the public in its true light will induce me to write a *book*, rather than a simple statement. The committee, however, aware of the magnitude and importance of this subject, and the eagerness of the public to obtain minute and authentic information, will I trust pardon the length to which this communication extends.

Much is said in various quarters respecting the different varieties of mulberry trees as food for the silk worm. By some it is confidently asserted that the multicaulis is inferior to the broad leaved Canton, to the Brousse, and to the hundred and one other varieties for which names are invented. Others go still further, and assert that the multicaulis is inferior to all other species, the paper mulberry alone excepted, which the worm will not eat at all, and that good silk *cannot* be made from the multicaulis, that it is the least hardy of all species of the mulberry, (which, however, has never been proved,) and that the quality of the silk will always be in proportion to the hardiness of the tree from which it is made.

Now I have no theories to sustain on this subject, and I think personal interest has no influence on my opinions. I have indeed some 40.000 of these precious trees, a considerable portion of which I would dispose of on reasonable terms to any gentlemen who want the genuine article, but I think this circumstance has no influence on my judgment. Other species of the mulberry may be good, as I have no doubt they are, they may even be better than the multicaulis for any thing I know to the contrary. *One thing I do know*, the worms devour the multicaulis leaves with great avidity—grow well—continue healthy—make good silk, in sufficient quantities to yield a net profit per acre of $108 to $180. This they have done for me two years in succession. As to the quality of the silk, I do not profess to be a judge. It obtained the *gold medal*, at the fair of the American Institute in October last, and intelligent judges pronounced it superior.

Now I say other varieties of the mulberry may *make more* and *better* silk than the multicaulis. But *has* any individual actually produced more and better silk from any other tree, from a quarter of an acre? Until this is done, the public will be slow to believe that so many intelligent men are deceived, and that the multicaulis is good for nothing.

Let us judge the tree by the quantity and the quality of the silk which it produces, and at present, I have no fear that it will be superseded by any other kind.

It is matter of great regret that men are found, professedly friendly to the silk culture who, from self-interest, pre-conceived opinions, or even partial experiments, are distracting the public mind, or rather *laboring* to distract it, respecting the kind of mulberry to be used.

The truth is, most or all the varieties in our country are undoubtedly good, and every extensive silk grower will undoubtedly be disposed to have more varieties than one on his plantation. I can however, with the utmost sincerity and confidence, *assure* the public it is my deliberate conviction, that the morus multicaulis will be the prevailing tree for silk in this country, as well because it is peculiarly adapted *to* the silk worm, as because great expense will be saved in gathering the leaves. The same amount of foliage can be gathered from the multicaulis, with probably *half* the expense that it can be gathered from any other variety of the mulberry.

I entertain now an unwavering conviction that the silk business will *triumphantly* succeed in our country. That it promises to do more for the comfort of the indigent and dependent portion of our community, especially for indigent females, and to add more to the wealth of the nation, than can now be told.

How much larger the profits will be the *second*, and succeeding years, if the trees are left out through the winter, as we trust they now will be, I cannot tell, as I have made no experiment on this point. Every one must see the profits will be larger. I believe it will be one-quarter to one-third greater.

What motives then, let me ask, are here furnished to embark in this business? Will not our farmers awake to their true interests? I would not persuade any farmer, if I could, to give up his whole farm to the silk business; the friends of the silk culture do not desire to see any of the present products of our soil diminished; we wish to enrich our nation by adding another to the list of her products, without affecting any that now exist. Let the farmer put a few acres of some hill-side, or unproductive part of his farm in morus multicaulis, and thus add to his income a few hundred dollars in a way in which he will scarcely perceive the cost. Let his daughters, one after another, if he has daughters, have the avails of the cocoonery in successive years, if these avails are not absolutely needed in the family. I am persuaded that by the avails of silk, produced even on a small scale, many of our farmers who are now in debt, whose farms are mortgaged to half their value, and who in consequence of this are able to do little more than live, will not only be free from debt, but will in turn have *their* money at interest; and what has been proudly said of Old Mansfield in Connecticut may be said of them. Every daughter in the family of adult years will also have her hundred or more dollars at interest, the avails of her own labor in the cocoonery.

I would *most earnestly* call upon multitudes who are engaged in no agricultural pursuits—who in consequence of the great revulsion in the times, are engaged in no regular business—many who are depending on the precarious results of speculation in its thousand forms, let these abandon the uncertainties of speculation, the excess of which has almost ruined our country, and which, if successful to them, adds nothing the wealth of the nation. Let all who are thrown out of business by the pressure of the times—all who are waiting for more propitious times in which to commence business—let *all*, *all* such embark immediately in the silk culture. Let them occupy lands now uncultivated and idle, and thus secure for themselves a stream of wealth, *certain as the flow of the tides*. A stream that will deepen and widen, on whose bosom they will be borne, safely and surely, if not rapidly to affluence and fortune.

Let fathers, whose lands in our older states are worn out, and whose enterprising sons are disposed to leave kindred and home for the far west, stock their worn out farms with morus multicaulis, and thus make it more profitable for their sons to remain at home than go to the west.

But a consideration which commends this subject to every patriot, philanthropist and christian, is the great benefits which are to flow from its general introduction to the poor and dependent portion of our community.

Even in our own happy country, there is a large class of individuals, who so far from adding any thing to the industry and wealth of the nation, are unable to support themselves for want of suitable employment. These are indigent females and children, and the long list of the aged and infirm.

The numerous labor-saving machinery, the production of the present inventive age, introduced into almost every department of life, has thrown out of profitable employment vast numbers of industrious and virtuous poor. How many worthy mothers of orphan children are constrained to ply the needle through anxious days and almost sleepless nights, to keep those children from the almshouse, while they are unable, from the want of employment suited to their tender years, to do any thing to assist their affectionate mothers? How many females and children obtain a scanty and precarious subsistence by picking berries of various sorts for a few weeks, for our city markets, who during the remainder of the year must continue in the lowest poverty or absolute want. Who *must* spend their winters in the poor-house, or live on the charity of the benevolent, and all this for the want of suitable employment. One of the most crying evils of the age is the inadequate compensation which female labor receives. This arises mainly from want of proper objects on which to bestow that labor. Indeed the secret of rendering any labor valuable, and insuring for it an adequate and equitable reward, consists in applying it to objects not only valuable in themselves, and suited to the ability of those who perform it, but which are capable of being made the means of increasing wealth. Now let philanthropy *exhaust* itself, and where can it find an object that will secure to female labor such a reward as the production of silk? Nature seems almost to have designed the production of silk for female hands. The whole work, from the feeding of the worm, to the production of the most beautiful and delicate fabric, can be performed by them, and in the whole process their labor is as valuable as the most athletic male.

Even the aged and infirm, by the aid of ingenious contrivances for moving along by the shelves, can perform almost the whole work in the cocoonery, while children gather and bring them the leaves. O! will not the blessings of multitudes ready to perish descend upon those who persevere in the midst of the most unnatural opposition in their noble efforts to establish the silk culture in our land?

In England alone, more than a quarter of a million of her people earn their bread in the manufacture alone of silk. And with a soil and climate admirably adapted to the production of the raw material, a skill and ingenuity equal to that of England or any other country on earth to manufacture it—will American patriots be content to exhaust our resources in sustaining her population—will they suffer our own labor to remain unproductive, our own poor but meritorious citizens to pine in poverty and want? How much longer shall we permit them to freight their steam packets with silken fabrics, crowd them into our market and take away in return nothing but gold and silver, and that too at a moment when the exchanges are largely against us, and when we are struggling almost to bankruptcy to equalize them? The production of silk in our country is *not now an experiment*, and considering the *vast interests* involved in its extensive production, it claims, and it has *a right* to claim the fostering care of our government in *any* and *every* way in which that care can be consistently bestowed. A brighter day is dawning upon our country. Another great staple is about to be added to her productions which will kindle joy and gladness in many a desolate heart, and pour a flood of wealth over our whole land.

D. V. McLean.

Freehold, N. J. Nov. 1839.

MESSRS. CHENEY'S EXPERIMENT.

From the Silk Grower.

Having met with uncommon success in feeding silk worms this year, we are induced to give a statement of our proceeding, and the method adopted by us to hasten their labors to a successful termination. We followed, as near as circumstances would permit, the plan recommended by Mr. C. Beauvais, an account of which we have published, and succeeded in terminating the crop in twenty-four days, and we venture to say that firmer and larger cocoons have not been produced by any silk grower this season. The silk reels admirably, and is strong, lustrous, and of a superior quality.

June 27th, the eggs were taken from the refrigerator, where they had been kept since the 1st of March, at an average temperature of 40° Fahrenheit. They were placed upon a shelf in the cellar, where the temperature was 60°. On the 29th, at 4 P. M. they were taken to the cocoonery, the temperature at that time being 78°. All worms found upon the cloths, upon their removal from the cellar, (being but a small number) were destroyed before the cloths were placed in the cocoonery. 86,000 worms hatched on the 30th of June, which we reserved for the experiment.

Date.	Internal Temperature. 6 A.M.	12 M	6 P.M.	12 M	External Temperature. 6	12	6	12	No. of Feedings.	Lbs. wt. of leaves.	REMARKS.
June 30	78	78	77	78	70	78	70	68	18	2	
July 1	78	78	78	78	62	78	77	68	18	4	Morning cool—used heat.
2	76	78	78	78	70	77	71	69	18	8	The weather clear in the morning, and the worms lively; in the evening rain; wind South East.
3	76	77	79	76	66	76	79	67		2	Worms commenced moulting.
4	75	76	75	75	65	70	75	60	12	16	Worms finished moulting.
5	72	72	76	73	56	70	72	60	12	22	Clear—wind N. W.
6	72	75	76	73	55	72	73	65	12	30	Wind E.—brisk fires during the day.
7	73	76	78	77	60	80	70	68		2	Commenced moulting.
8	72	77	78	75	65	78	76	70	12	14	Finished moulting.
9	74	76	77	76	66	78	76	70	12	30	
10	71	79	82	79	65	80	82	72	12	80	Clear—wind S. W.
11	76	82	80	75	71	87	74	68		6	Commenced moulting.
12	72	75	74	73	65	71	72	62	9	80	Finished moulting.
13	72	75	75	75	64	78	70	67	9	130	
14	72	75	75	74	68	76	74	67	9	200	
15	72	76	75	73	67	78	72	65	9	134	
16	70	75	76	72	64	79	78	64		10	Commenced moulting in the evening.
17	74	76	75	76	69	80	78	67			Quite dormant—not fed.
18	70	78	80	77	68	84	85	72	8	140	Finished moulting early in the morning.
19	72	82	84	79	68	88	90	76	8	260	
20	76	82	82	78	76	86	82	74	8	400	
21	75	79	78	78	73	80	76	73	8	680	
22	74	82	82	79	74	86	82	79	8	920	
23	75	79	82	77	75	82	86	75	8	600	Showed signs of winding—food diminished.
24	72	79	77	75	70	86	75	73	8	200	Commenced winding.

The worms were what is generally termed the "six-weeks sulphur," and it will be seen by the above statement that they terminated their labors in twenty-four days. The amount of cocoons was 865 pounds, and it required 225 to weigh a pound. The amount of leaves fed out was 3,970 pounds, which gives 11 pounds of leaves to a pound of cocoons, and 9 pounds of cocoons being required to produce a pound of silk, it will be seen that by this system of feeding, 99 pounds of leaves only are necessary for one pound of silk.

[In a subsequent number, the editors of the 'Silk Grower' remark as follows:]

The conductors of this work have just published a 'Synoptical Table for the most speedy growth of Silk Worms,' translated from the French, in which the size of the worm is given, as it actually is, each day of its existence, and handsomely colored. The feeding was after the manner of M. C. Beauvais, with M. Darcet's process of ventilation. It will be recollected that this method was adop- by us, in a degree, and the result published in our last number, in which it was conclusively shown, by our great success, that it is the most sure and and profitable of any extant. There is but little difference between the result as given in the plate, and that obtained by us, M. C. Beauvais having produced 165 lbs. from 2,000 lbs. of leaves, and we 356 lbs. from 3970 lbs. the difference being in his favor, which, undoubtedly, is owing to the plan of ventilation (Darcet's) adopted by him, and which it was impossible for us to use at the time of our rearing. Next year we shall introduce it in our cocoonery to the full extent, and doubt not that our success will be equal to that of M. Beauvais.

We are fully satisfied that a properly regulated temperature, ventilation, cleanliness, strict attention and the frequent feeding of the worms, are all that is required to enable the American people to raise silk with a greater profit than can possibly be done by any other nation, even if we take into account the price of labor in different silk growing countries. Blessed with a proper soil, a suitable climate, and an energetic and enterprising population, America is destined to take the lead in all that appertains to the culture and manufacture of silk.

THE NATURAL AND ARTIFICIAL SYSTEMS.

[*Remarks on the two last articles.*]

From the Journal of the American Silk Society.

We are enabled in the present number to present to our readers a fair example of each of the two great modes of raising silk worms, the natural and the artificial. The first is that of the Rev. Mr. McLean, whose very lucid exposition of his experiment forms the first article in this number; and the second that of Messrs. Cheney, commencing at page 361. The first is strictly the natural system, and is the one that will be generally adopted by the people at large; the second is clearly the artificial system, which will only be followed by those who make a business of the silk culture, and who of course will endeavor to make the most of time and capital. We beg the reader's attention to the great difference in the results of the two experiments. In the natural system, 40,000 worms consumed 2,576 pounds of leaves; in the artificial system 1,985 lbs. These worms produced 130 pounds of cocoons in the natural system, and 178 lbs. in the artificial. The cocoons weighed at the rate of 300 to the pound in the natural system, and 225 to the pound in the artificial. It required 10 lb. 6 oz of cocoons produced by the natural system to make the pound of silk; and 9 pounds of those by the artificial. The 40,000 worms fed on the natural system made 12 pounds of raw silk; the same number fed on the artificial system made 19¾ lbs. The natural system required an average of fully one week more one time to produce the cocoons than the artificial system occupied.

We have drawn these comparisons merely for the purpose of showing the difference of results produced by the two systems. We are fully persuaded the people generally will adopt the natural system; but it is proper, that they should be informed how much more they can make by careful management, than they can hope to accomplish by ordinary means. It will be seen by examining Mr. McLean's paper, that the first year the trees are planted at least, and under all circumstances, $108 can be made from an acre of ground, after paying for the hired labor of producing the silk. It also will be seen that the silk can be made ready for market, at $2.45 a pound; and that, even if sold at only $4.50 per pound, a clear profit of 100 per cent. results to the cultivator. What better business can any man pursue? G. B. S.

GREATEST KNOWN YIELD OF CORN.

From the Romney Intelligencer.

We are informed that George C. Harness, Esq., of Hardy county, raised the past season, from *one* acre of ground, *one hundred and seventy-eight bushels of corn*. Mr. H. cultivated the same with a view of premium at the approaching agricultural exhibition of Hardy county, and the husking and measuring of the corn was attended to by a disinterested, intelligent, and highly respectable citizen of Moorefield. This is the most extraordinary yield, from one acre of ground, that we have ever heard of. Truly, may the South Branch Bottoms be termed the "garden spots" of the union.

GREEN CROPS FOR MANURE.

To the Editor of the Farmers' Register.

Ewing, N. J., November 8, 1839.

I am pleased with your essay on green manuring contained in the September number of the Farmers' Register. I top-dressed young clover with yard manure last spring, mowed the first crop the last week in June, ploughed in the sod in August, sowed corn the last week in August, ploughed in the corn the last week in September, sowed wheat the first week in October. The experiment will not be a fair one for various reasons, 1st, the clover was killed (with the exception of patches) by the excessive drought of last summer; 2nd, the first ploughing and corn sowing was too late, and in order to let the corn get top, the last ploughing was too late. I intended to have ploughed as soon as the clover was mown, and then sowed my corn; but the men who promised to mow for me disappointed me, and I was obliged to defer my ploughing until haying was over. If I live, I intend to try it again next season, and be in better season if possible. I sowed my oats last spring with clover; much of it has been smothered by the large crop of straw.

I have been thinking that your section of country is more favorable for this kind of experiment than this place. With you, clover might be top-dressed in the spring, mowed the last week in May, or the first in June, plough up immediately, sow corn, one and a half bushels to the acre, and about the first of August plough in the corn and sow millet, and about the middle of September plough in the millet, harrow the land, and let it remain until seed time (which I suppose to be about the middle of October with you). Here seed time is the last week in September and first in October. I propose millet on account of its being a succulent plant of quick growth, partaking much the nature of corn, and a native of a warm climate. I think the more succulent the plant the more valuable for green manure. Winter crops should be sown on a stale furrow, i. e. the land should become compact or close before sowing; for summer crops, loose and mellow.

I think if this system was pursued a few years in succession, the chinch-bug and Hessian fly would not destroy our wheat. Barley is said to be a better crop to seed down with grass than oats. I commenced ploughing my corn ground for the next season on the 15th October; did intend to sow rye, and plough in the rye next spring, the last week in April; but it is so late I shall give it up, because the rye cannot get up enough to do much good. I am aware that none of this will avail any thing, if the land is destitute of lime, but was not aware of it until I read your 'Essay on Calcareous Manures.' I find lime eradicates sorrel.

In my opinion if we wish to improve land we must return more to it than we take from it. So long as we take more from it than we return to it, we are exhausting it, and so long as we return more to it than we take from it we are improving. A constant exhaustion will in time impoverish any soil.

It is amusing to hear farmers give their opinion on ploughing in green crops. Some say that a crop cannot benefit the land by ploughing it in, unless it first comes to perfection or maturity; others, that corn-stalks (referring to my corn) give but little manure, and that of poor quality; others say it is too expensive. The expense is the seed and sowing. Fifteen bushels of corn will sow 10 acres, and one man will sow it in one day. It reminds me of your observation in the 'Essay' where you say, "let any thing new be proposed, and every one goes to counting the expense; while, in regard to old established practices, the expense is not even thought of." One thing that is practised here is too expensive, and that is, carting out the yard manure and lying it in heaps until fall, and then misapplying it, i. e., to the wrong crop, the wheat; it is a loss of labor and manure.

S. S. Hunt.

A LARGE HOG.

From the Haverhill (N. H.) Republican.

We notice in several of our exchange papers an account of a very extraordinary hog raised in Wallingford, Vt., and sold for *two hundred dollars* to a gentleman who designs to transport him over the country as a show. He weighs, it is said, *sixteen hundred pounds*, and is *three or four years old!* He is a monster indeed. We several years since saw a hog that weighed 1350 lbs. and was thought to exceed every thing in the hog line. There are, at this time in this town, several very large hogs, one owned by Mr. Timothy Rix, which is estimated to weigh eight or nine hundred pounds, and is not yet, we believe, eighteen months old. Should the creature be kept until he reaches the age of "three or four years," we doubt very much whether the Wallingford hog would have much to brag of when compared with the hog of Mr. R. Mr. S. Bliss also has a very large hog, which in the course of a year or two, could be made to go ahead of either of the others alluded to. He has a frame to build upon, and should be kept for the purpose of showing that some things can be done in this section as well as in other parts.

HOG MANURE.

From the Genesee Farmer.

For aiding the growth of many plants, and particularly corn, we have never found any manure the application of which produced such effects as that from the hog pen. Last year we had a field of corn dunged in the hill, part of it with alternate loads of hog-pen manure, and common good stable manure. Each load planted about five or six rows. From the commencement of their growth, till the ripening of the corn, the rows manured from the pig-pen had the advantage, and at harvesting they yielded a much large quantity of corn than the others, though all was excellent. A neighbor, the last spring, in planting his corn, used good stable manure, except for some few rows, for which the stable manure falling short, he substituted a load or two from his hog-pen. The difference in the size of the corn from the first, was such as to arrest the attention of every passer by, and though the year has been unfavorable for corn, it has given a handsome product compared with the other. Other instances have this year fallen under our notice, the results of which were precisely similar, and have established, in our opinion at least, the superiority of this manure over every other. Its greatest effect, however, so far as our experience or observation has extended, is produced on soils of a loamy or sandy texture, and on vegetables that require active manures to bring them forward rapidly.

It appears to us, then, an object of considerable consequence to the farmer, that he should avail himself of this resource for fertilizing his soil, as as far as possible, and that methods should be adopted by him to preserve and increase the amount at his command, as far as may be, and not allow the avails of his pig-pen to be lost to the farm, as is not unfrequently done. Where pigs are allowed a small yard to run in from the pen, they may be made to produce a large quantity of good manure, by frequent additions to the material in the yard, of straw, weeds, turfs, muck, or even good common earth, to absorb the fluid part of the manure, and preserve its salts from escaping. In this frequently renewed mass, the pigs will love to work; and if any disinclination is manifested in them to stir this compost heap, a few handfuls of corn scattered over the surface, will speedily overcome it, and set them busily at work. If the pigs cannot leave the pens, the stye should be frequently cleaned, and care should be taken that the dung so thrown out is not lost to the premises. A load of muck, or vegetable mould, occasionally mixed with, or thrown upon the heap, will, when the time for using it in the spring of the year arrives, be found, from this absorption of salts, and combination with the manure, an application of much greater value than common stable manures, for most of the crops cultivated by the farmer. Fresh manure of any kind should not be applied directly to crops of grain; as they are apt to produce too much straw and endanger the formation of a good berry. Manure should be first applied to roots, or to corn, and grain follow; by which the danger of a too rapid growth is avoided.

"DISTEMPER," OR MURRAIN AMONG CATTLE.

To the Editor of the Farmers' Register.

Lincolnton, N. C., Nov. 25, 1839.

I have noticed in your September No. of the Register the letter of W. I. Dupuy respecting the distemper in cattle, commonly called the "murrain," asking for the experience of those acquainted with the disorder, and facts connected with it from any person who may think proper to communicate. It has been my lot to have some experience with the disorder in two places in the state of North Carolina, more than one hundred and fifty miles apart; and believe I understand the origin of the disorder, but am not as certain of the cause of its continuance when once introduced in any section of country, or of its ceasing. It is generally believed that the disorder is caused and spread by driving cattle in hot weather from the lower country, from the long leaf pine to the upper country; why it is so I cannot say, but will relate how it was introduced in both places. My first acquaintance with the disorder was on the waters of the Roanoke, near the Virginia line, about the middle of the state of North Carolina. The disorder was introduced by a large drove of cattle driven from the southern part of the state, and lower country, in August as well as I recollect. The drove was owned by a man of the name of Martin, and passed through Granville, intended for the Petersburg market. The disorder was left along the road where I then resided, and extended as far as I heard from the drove, and spread out on each side of the road. This I think was in the year 1794 or 95, when I was a boy. After settling to myself, the disorder got into my stock, and killed nearly half of them; but where it originated I cannot tell; it seemed to approach gradually from the lower country. It was introduced into the section of country where I now am by a gentleman moving from one of the lower counties, using oxen, eight yoke, for his teams. The number was not sufficient to spread the disorder along the road, but wherever the mover stopped to feed, or stay a night, the disorder was produced and spread, until he reached the mountains; the nearer the mountains, the less the disorder spread, and only lasting one season, and when the mover got into the mountains, he took up camp for some time, and let his oxen range in the mountains, and in a few days they lost that property which caused other cattle to take the distemper. The oxen were worked with others raised in the mountains, without any injury to them. This change it was believed was produced by a change of food, water and air, in the mountains. From these circumstances I am satisfied that the origin of the disorder is with cattle from the lower country, driven in hot weather.

The continuance of the disorder in any country, and how communicated, is a mystery. In my first acquaintance with it, when any cattle died, they were burned up or buried, in order to prevent the spreading of the disorder; but a cow drived in hot weather from a place where the distemper has never been, and she would take it, when not a bone or any other part of those that died could be seen. And no new in this section at this time. You may remove a cow from distempered ground to distempered ground, without much danger, but not from undistempered ground. I have moved cattle from sections where the distemper has never prevailed, after hard frost has set in, and never lost but one or two, when the summer set in. But ever when I move from one distempered place to another, in warm weather, I use some preventive, by giving plenty of salt and wheat bran, or something to keep their bowels open.

As to the cure of the disorder, there are many remedies spoken of by different persons. Some use salts, glauber or Epsom, which I have known to cure in many cases if given in time. Some give calomel in large doses, and I have heard a decoction of the May-apple root spoken of as beneficial. Indeed, I think any thing which will purge is good. Castor oil will not answer; I have tried it.

The best way is to use care and prevent the disorder from getting among your cattle. I had two neighbors, whose cattle ran in the old fields with their neighbors' cattle, who did not lose a single head, when their neighbors' died, and in the old fields where they fed. I asked them what they used to prevent the disorder from getting in their stock. One of them told me he did nothing but salt highly, that he constantly kept salt in the troughs in his cow-pen. The other said he used salt freely and frequently, had tar put on them, and in their troughs. It is said salting on the ground is good. Any thing which will keep the bowels of the cattle open is good; but begin in time, as the warm weather approaches. Keeping in enclosures will not prevent the disease, nor will ranging at large produce it, as I know from experience.

The gentleman who "entertains the belief that the hollow horn and the distemper are the same disorder" is entirely mistaken. The appearance of the cattle is very different, with the two disorders. I have seen cattle have the hollow horn, where the murrain distemper was never known, and cured in the way he speaks of, by boring, and putting in pepper and salt. Cattle having distemper may have hollow horn for any thing I know, but they will have hollow horn and not murrain, I well know.

Yours, &c.

A SUBSCRIBER.

P. S. Cows with hollow horn will eat well, but not thrive; but cattle with murrain will not feed, or eat any thing.

OKRA, OR ALVARADO COTTON.

From the Farmer's Gazette.

We make the following extract from an advertisement in the Columbia papers offering for sale the seed of this cotton.

"Dr. J. H. Taylor from little more than 1-4 of the stand he ought to have had, gathered upwards of 1,200 lbs. per acre. The following is an extract of a letter, from Dr. Taylor: You must observe, I had not more than 1-4 of a stand, and planted, too, at 5 feet, instead of 3; and yet I will make about 1,200 lbs. per acre. I believe it capable, on the same land, of yielding 5,000 lbs. planted at 5 feet in double rows. If I live another year I will try a hundred acres that way." Mr F. M. Gilmer of Montgomery, Alabama, from as bad a stand, gathered 1,400 lbs. to the acre. Mr. C. T. Billingslea, of Bibb Co. Alabama, from 1-4 of an acre, gathered 1,060 lbs. and expected 200 lbs. more. Mr. Aldridge, who first cultivated this cotton, it is said, raised 3,000 lbs. per acre, this year, and refused $30,000 for his crop of 30 acres. Dr. J. H. Taylor, from 22,000 lbs. of seed cotton, ginned 13 bales of 600 lbs. average; or 35 lbs. of clean, to 100 of the seed cotton. Jesse P. Taylor, well known here, weighed 425 lbs. of Petit Gulf, and the same of okra, in the seed, and ginned each; the result was 124 lbs. of ginned Petit Gulf, or 29 lbs. to the 100, and of okra 156 lbs. or 36 2-3 to each 100 lbs. of seed cotton. The staple is decidedly finer."

The price of the seed here offered for sale is $100 per bushel, $20 per gallon, and $5 per quart; which are stated to be the Alabama prices.

LIME FOR THE MOUNTAIN LANDS.

For the Farmers' Register.

I have lately made an excursion of pleasure through the Blue Ridge mountains in various directions, from Aldie to Warrenton, and surely a finer country no reasonable man could wish or desire. Uplifted from the deep abyss as those mountains evidently were, when old mother earth was yet in her teens and callow feather, God only can say what is their age, but sure I am, that they are old enough for the comfort of man and beast. It is not material to agriculture whether they were blown up by subterranean fires or lifted in her callow feather by too near an approach to some rough fisted planet, which in passing, may by way of warning, exhibited some of its gravitating and whirlwind powers, and thereby lifted those "cloud capped" mountains from the lap of dear old mother earth. Fearful and unscrutable are the ways of God. It is said that lime is of no avail in those mountains; but, that plaster-of-paris is as fresh and full in its operations as when first used 40 years ago; if so, age may be a substitute for lime, or it may through vegetable medium thus far furnished lime for agricultural use. The grass of those mountains is singularly fattening to stock, and at some future day they will be devoted to stock alone.

Assuming that lime is not wanting to mountain land, it follows that the price of liming will be saved, and their stock can come to market very cheap; but from my observations upon their clover and corn, I cannot but believe that lime will greatly benefit their grain and grass. It is to be hoped that some one will make repeated and various trials of lime, that every possibility of mistake may be avoided. Much is said about a railroad from Washington to Falmouth, and one from this to Warrenton. Should those roads be made, I have no doubt that the use of lime will re-imburse the expense four times told. All the country from the Ridge to tide water in its present condition (save that which is alluvial) is little more than a pest and curse to the owner. But give it a good dressing of lime, and I predict that it will be noted for its production and beauty. The extensive bottoms upon Bull Run, Cedar Run, Town Run, and some half dozen other streams, will, by the use of lime, become noted for their production of grass and grain. Had I the spirit and constitution of Peter the Hermit, I would go among the people of that country and hold the vengeance of heaven over them if they did not come out in every possible shape to make this rail-road. What sir! live and die in a hen-grass field, when green fields and plenty beckon them to an easy service? No, it is impossible. Let the people band together and vow that they will never give over the pursuit until the work is accomplished; let them remember that Baron Trenk made his way through a five-foot stone wall with a nail, and that every man among them is his equal. LIME.

Fairfax county.

ADDRESS TO THE AGRICULTURAL SOCIETY OF FREDERICKSBURG, BY JAMES M. GARNETT, PRESIDENT.

Another anniversary, my good friends, has once more brought us together, and I confidently trust, with a degree of zeal in our cause, rather invigorated, than depressed, by the utter failure of another effort, last winter, on the part of some of our worthy brethren in the General Assembly, to obtain legislative aid for Virginia agriculture. Could my wishes prevail, it should bethe last, the very last attempt of the kind, while the law-makers of our good old state continue to be chosen by no other standard than that of party-politics, and almost to the entire exclusion of moral and statesman-like qualifications; the chief thing sought in our representatives being such India-rubber consciences, as will stretch or contract according to order from the higher powers. Legislative aid to agriculture! it is the height of folly to expect it from legislators who altho' chiefly planters and farmers themselves, appear as entirely regardless of all the great agricultural interests of our state, as if they were its most deadly enemies. Seemingly, both deaf and blind to every thing but party-politics, for many years past, session has generally been after session spent, either in wearisome and profitless discussions of mere political abstractions, or in bitter and disgraceful quarrels; alike injurious to the peace, the harmony, and the welfare of Virginia. For all this, we ourselves, are as much to blame as they are; for instead of rewarding their total neglect of us, by relieving all who are guilty of this neglect, forever hereafter, from legislative duties of every kind whatever, we actually encourage it by re-electing them. That it is in our power to rid our General Assemblies of all such worse than useless members, none, I think, can doubt, who know our numerical strength as voters; and that we have not exerted it long ago, for this purpose, has always been to me a matter not only of much surprise, but of the deepest humilation;—especially, when I reflect, that nearly every other state in the union has been so thoroughly roused to a sense of its own best interests, as to be making strenuous and well directed efforts for the advancement of husbandry in all its branches. They have been taught by the truly glorious examples of most of the governments of Europe, but particularly by the conduct of Scotland and England, how incalculably national comforts, wealth and general prosperity, may be increased by legislative aid to agriculture; and they—our wiser sister states—have profited accordingly; whilst we,—(alas! how fallen!) have been manifestly sinking in the scale of comparative power and influence,—solely, too, as I verily believe, from the causes which I have stated. These painful truths would certainly have been kept to myself, if I deemed our case a hopeless one. But having entire confidence in the power of our brethren to correct, in a great measure, the evils of which I complain, simply by the proper exercise of their elective franchise, death only shall end my efforts to rouse them from their most unaccountable and self-destructive torpor.

But enough of this for the present, and I will now proceed with my usual detail of experiments since we met last, begging you always to bear in mind, that I do it more from a sense of duty, than any great confidence in their value. But it is the best way I can think of to manifest my grateful sense of your invariable and long continued confidence—at least in the earnest sincerity of my endeavors to promote our cause—endeavors which shall never cease whilst life and health enable me to make them.

As I consider Indian corn by far the most useful of all the grains at present known to us, I will first state my several comparative trials with ten different varieties, which I procured for the purpose of ascertaining which was best; and I will begin with the Baden and Dutton—this being the second trial between them. In the latter case they were planted in contiguous rows, the Dutton 3 and the Baden 4 feet apart, each way, 2, 3 and 4 stalks to the hill, in well manured garden-ground, rich enough to produce 65 or 70 bushels to the acre of our common varieties planted at our usual distances, for such land. The result of this second trial differs so entirely from the former, as compels me to conclude, either that some mistake was made, or deception practised about the seed; although in both cases, they were distributed gratuitously, and by members of Congress. If this conjecture is unfounded, the result proves that several more experiments than one or two are necessary, at least in regard to corn, if not with all other kinds of agricultural products, to decide conclusively on the relative merits of any which we compare together. Yet a single trial often suffices with many of us, to make up our opinions *for* or *against* some particular thing, when a little more patient attention and perseverance would lead us to conclusions entirely opposite to those which we first formed. This utterly defeats the object of all agricultural experiments whatever, which is to arrive at the utmost attainable certainty in our efforts to ascertain what is best; and moreover, it is the chief cause of the endless disputes with which our agricultural papers are continually crammed, making "confusion worse confounded" about various matters which long ago, ought to have been finally settled. It is this precipitancy in jumping to conclusions, and founding theories of systems upon a few isolated facts, which, more than all other causes, prevents that constant, regular, effectual advance in all the arts of husbandry, which we might and would most surely make, if we would never fail to note without prejudice, and with the utmost practicable accuracy, every circumstance connected with all the experiments we undertake to try. In no other way can much progress be made, or great proficiency and certainty acquired, in any art or science whatever, which is dependent upon a series of experiments frequently and accurately repeated—nor is there one in the whole circle that requires them more than agriculture. He alone who pursues such a course is justly entitled to the character of a good farmer; and he deserves it too—although comparatively young in his profession, incomparably better than the man whose only claim to it rests upon his having followed the same vocation from early youth to hoary old age, without a solitary effort to ascertain whether it was susceptible of improvement or not; yet, too many foolishly suppose, that *to be old* means the same thing as *to be wise*; and of course that all aged men have much more knowledge and experience than young men can have in the same profession; although it is notoriously true, that thousands of our brethren, at the end of a long life, are nearly as ignorant as when they first began it, of all the great and fundamental principles essential to eminent success either in agriculture or any other branch of husbandry. They live and die content to know nothing beyond what their fathers taught them; and finding that they can make a little money in the old hereditary track—not an inch farther do they ever look—not a thought beyond will they ever spend, as to the possibility of doubling or quadrupling their income by adopting any, even of the best ascertained improvements, which are almost constantly making in every branch of husbandry. These being generally announced to the public *in print*, are branded by them with the stigma of "*book-farming*," and of course are treated with the most unqualified contempt.

It is true, that there may be too much credulity—too much haste in adopting new things and practices. But if we *must* choose between them, and the extremes of *stolid ignorance* and *incurable self conceit*, I have no hesitation in believing that society in general has been and ever will be much more benefited by the first than the last.

Without a strong and persevering desire to invent and discover, no great improvement ever has been, or can be, made in any art or science whatever; nor is it a good objection to this desire, that it should sometimes become so enthusiastic, as to operate against the worldly interests of those who are under its influence. For millions of mankind, in all time to come, will continue to be blessed with the fruits of discoveries and inventions made by men whose whole fortunes have been spent in making them. Many of these true benefactors of our race, (and to our eternal shame be it spoken,) have been suffered to die in utter poverty, whilst thousands upon thousands of us have been enjoying in perfection all the advantages of their unrequited labors, in contented ignorance of the source from which we derived them, and perhaps ascribing, or least a part of them to ourselves; altho' probably, if the truth were told, we should be ranked in that class, which, according to the quaint saying of a highly esteemed old friend, were made for the same purpose with pewter sleeve-buttons, *merely "to fill up the assortment."* Most happily for society, we are not all pewter sleeve-button-men, or we should be in the same predicament, as to every useful invention, that father Noah's family were when they first began to till the earth after the universal deluge. It is, alas! too true, that we still have vast multitudes of drones in our social hive—drones that do much to mar the prosperity and disgrace the character of our good old mother Virginia. But thank Heaven! we still have enough working bees of the native stock, aided by occasional swarms from northern and eastern hives, to keep up such a honey-gathering as enables us "to go ahead, pretty considerably," as brother Jonathan, would say. By the way, it would be far better for us, in every respect, if we would strive to imitate brother Jonathan in his public spirit—his industry—his indomitable perseverance under every change of fortune, however discouraging, to better his condition, than to amuse ourselves with his peculiarities, and neglect to benefit by his example whenever it is good, merely for the sake of laughing at his provincialisms, and at what we are pleased to call his "*odd ways*," without reflecting, for a moment, that our ways are probably, quite as *odd* to *him*, as his can possibly be to *us*. Steam-boats and rail-roads, I confidently hope, will cure all these senseless prejudices, by the constant inter-communication which they must almost necessarily produce between all the citizens of our vastly extended community; a community, which if wisely governed, may exhibit to the whole world the greatest—the most illustrious example of what mere government can do towards producing national happiness, that the annals of history have ever recorded.

But you must pardon this disgression, and I will proceed with the statement of my experiments. The first, as I heretofore remarked, was with the Dutton and Baden corn. Both were planted on the 9th of April, and received precisely the same culture, which was altogether with the hand-hoe—the spot of ground being too small to introduce a plough. But it was well worked four times. The Dutton began to tassel about the 28th of June, the Baden at the end of the following week; although the difference, in this respect, between the two kinds which I received last year under the same names and from the same source, was quite three weeks. A still more striking difference was, that the Dutton of last year, was literally a dwarf-corn in every respect—lower than the Baden by three or four feet, and producing much smaller, although more numerous ears; whilst the latter was, in the first trial, and has been in the second, the tallest corn I ever saw—shooting much higher in both trials, than any of our common varieties, and having smaller ears. The Dutton corn, of the present year, has grown as tall as any kind except the Baden, which it fully equals in the size and number of its ears, although neither has any thing to recommend it in this respect. In this trial I have noticed two things which have struck me with much surprise. One is, that the Dutton corn, although the earliest, has been considerably changed by the Baden; for it has many white grains intermixed with the yellow, whereas the latter has no yellow grains mixed with the white. But a still more remarkable fact is, the proof exhibited by one ear of the Dutton, that the change in the color of the grain commences in the outer end of each instead of the small end next the cob, with which the silk directly communicates. This circumstance in the physiology of the corn plant is, to me, altogether unaccountable and I should be much gratified at seeing some rational explanation of it. What I have further to say of the two varieties just mentioned is, that my two trials of them induce me to conclude that neither will suit our climate and latitude. Great as the difference has been in the results of these trials, both have fallen immeasurably short of the characters which some of our newspapers have given of the two varieties. But it is possible that I might not have obtained the genuine kind in either case; for such is the unprincipled cupidity of a vast proportion of seed and plant sellers, that the moment they discover the slightest indication of an opportunity to make a profitable humbug of any thing in their line, they leave no art, however knavish, untried to effect their purpose, even to the substituting of one kind of seed or plant for another, wherever they can do it without the risk of detection and exposure. The most barefaced thing of the kind that I ever knew, occurred last spring or winter. One of these humbuging gentry, not content with the popular title of "Baden corn," in advertising some which he wished to sell, called it "*the true twin Baden or tree corn*," although he must have known perfectly well, that two of these titles belonged to other and distinct varieties. This most shameful and truly dishonest practice not only greatly discourages us from making experiments, either with corn or any thing else, but often defeats entirely our object in making them, which is to ascertain the best and most profitable crops to cultivate. For this evil there is but one cure, and *that is*, to save our own seed whenever we can, and when we cannot, to buy only of seedsmen whose characters are irreproachable.

My second corn-experiment was with the mixed seed of the four following varieties, to wit:—twin-corn, Carmichael's improved do.—Alsop's and Baden's—all of them white, and somewhat resembling each other in character. The only visible effect was an increase in the size of the ears but not, so far as I could judge, in the product per acre. And here I beg leave to express an opinion founded on my own experience, corrobated by that of all the best corn-planters with whom I have conversed on the subject. It is, that the larger the ears of corn are, the fewer there will be on a stalk, and the less will be the proportion of grain to the quantity of cobs, and the size of the stalks, compared with the smaller eared varieties, which, in all the instances that I have noticed, have ripened sooner, had more ears, with much less cob to the grain upon each, and consequently have produced more per acre, and shelled out more to the granary in which they were housed. To these facts there has been no exception in five trials, as accurate and fair as I could possibly make them, between five distinct varieties of large eared corn, three of which trials were made this year, and the twin-corn which I first obtained from Governor Lloyd, of Maryland, but have greatly improved since, by careful selection. The latter has, in every case, produced many more ears, more grain, and weighed more per bushel than all the other varieties but one, which was a large-eared corn called Richardson's, the seed of which I procured from Spottsylvania. This it exceeded in measure, and equalled in weight. Even in the best land, whereon I have tried the large kinds, they have rarely had more than one ear on a stalk, whereas the twin-corn in similar soils, has very seldom had less than three, and not unfrequently from four to six, sometimes even seven or eight, although these of course were small. In my crop of the present year, which is chiefly of twin-corn, I have noticed a growth of so extraordinary a kind, that I should have some hesitation in mentioning it, if I had not exhibited a proof of it to you, at our last anniversary. I have found several stalks with two distinct ears growing on a foot-stalk or branch from one joint; two I found with three ears, and one with four, all separate, and on the same branch from a single joint. The last has three other ears growing on foot-stalks or branches from other joints. This circumstance I have mentioned to many old corn planters, but have not met with one who had ever seen or heard of any thing of the kind. I myself deem it so remarkable, that I shall send the best specimen to that very good friend of our cause, Mr. Ellsworth, the Commissioner of Patents, who is making a collection of every thing rare and excellent which can contribute in any way to promote the agriculture of the United States. I avail myself of this occasion to announce his object, which is truly patriotic, that all who sincerely love their country may zealously aid him in attaining it.

To you, my brethern, who know me so well, no disclaimer of selfish motives, I trust, will be necessary in regard to any thing I have said in favor of the twin-corn. But many to whom I am an utter stranger, may probably read it, and possibly may rank *me* among those contemptible wretches, now so common, who are ever seeking to make a profitable humbug of any thing, however worthless, if they have the faintest hope of exciting credulity enough in the public to effect their purpose. They are true swindlers in spirit, if not in fact, and have lately become so numerous and successful, that I could not blame entire strangers for suspecting me of wishing to play the same game with a grain which I have so highly commended. I therefore deem it necessary, should there be any such persons, to assure them that I have not the slightest desire nor design to offer *my* twin-corn for more than my neighbors ask for theirs, neither do I wish to sell it in small parcels, which is always very troublesome.

But there is *another error* in regard to myself, against which it may perhaps be well to guard even *you*, my old and intimate associates. It is the suspicion that I may have made a *hobby* of this corn. Should any of you entertain it, I confidently trust that it will instantly vanish, when I call your attention to the fact, which I have already stated, that during the present year I have made a fair comparative trial with no less than nine others varieties of corn; and that I feel pledged to continue similar trials as long as I can procure different kinds of corn wherewith to make them, my sole object being to ascertain the best in every respect, that our country produces. I have already ascertained, and as I verily believe beyond the possibility of having been deceived, that the twin-corn is more productive by at least 15 per cent., than any other with which I have tried it; and such a difference, even in a single crop, is well worth regarding, to say nothing of an equal annual difference during a man's whole life. Now, if this has been the result, as it certainly has, of the careful selection of seed corn, for a series of years, (a practice first published by a Mr. Joseph Cooper of N. Jersey,) may we not well hope to make still greater improvements in the quality and productiveness of this prince of all grains, by pursuing the same means, and continuing to make comparative trials between all the most popular varieties we can procure? Although there must be a limit to the improvement of all plants, I think it almost certain that none of us have yet reached it in regard to any that we cultivate; and this should stimulate us to unceasing efforts for the attainment of an object so highly important and desirable.

There are two of my corn experiments which I have yet to mention—both with dwarf varieties—neither of which have I compared, either with the twin corn, or any other kind. One I received under the name of the Long Island yellow, flat corn; but was prevented from measuring either the ground or quantity of grain, by its being gathered without my knowing it in time. All therefore I can do, is to report upon it by inspection. It has longer cobs than any corn I ever saw, being generally from 10 to 12 inches in length—one I found that measured fully 14. It has 8 or 10 rows on the cob, of broad grain, of a rich orange color, which is fit to grind early in August, and which, one of my brothers from whom I obtained it, informs me weighs 61 to the bushel. Even in our climate, I think it would be productive, as it grows so low, that, in rich land, it might be planted 3 feet each way, with 2 and 3 or 4 stalks in a hill. This might be well worth considering by those bad providers who sell out their corn before Christmas, and buy before midsummer, if they had any rich land in which to plant an early variety; but most unfortunately for them, they are rich only in bad habits, which starve the stomach, at the same time that they exhaust the purse, and thus burn their candle at both ends.

My last corn experiment was with the kind designated by the captivating title of the "Chinese tree-corn!" which has been rendered notorious throughout the United States, by the Munchausen puffs of a certain benevolent gentleman who professed to sell it for "*charitable purposes*," at the very moderate price of 25 cents a ear! Now, notwithstanding there is strong reason to suspect that *his* charity, like that of many other professors, has ended where it began—at home; and notwithstanding *his* corn has fallen so wofully short of the character which he gave it, I must say, that *my* trial of it illustrates as completely as any thing I have ever known, the truth of the old saying, that "*the devil is not as black as he is painted.*" Of this I offer the following statement as a satisfactory proof. I myself selected an ear of this famous corn, last winter, in Thorburn's store in New York, out of a barrel just opened, and received afterwards as a present, half an ear, also bought from the same store by a highly respectable merchant of that city. I planted the grains of both on the 7th of April, in high land, such as I believe would produce 5, and possibly 6 barrels of our common varieties of corn, planted at the usual distances. Two rows were planted 3 feet apart each way, leaving 2 and 3 stalks in a hill—in a few instances 4. The third row, by mistake, was made 5 feet from the others, but left with the same number of stalks the narrow way. The whole ground was worked once with the plough, twice with the cultivator, and twice with the hand-hoe. The grain was fit to grind early in August, but the stalks including the tassels, measured only about six feet in height, and the whole appearance was so unpromising, that I probably should have given all of it to the hogs, had I not planted it specially for an experiment with which I was determined to go through, as I make it a constant practice to do with every thing of the kind. I therefore let it remain without pulling the blades or cutting the tops, until the middle of October, when it was carefully gathered in my own presence, having previously had the ground accurately measured with a surveying tape. This turned out to be within 40 square yards of the 16th of an acre; and to my great surprise, produced two bushels of sound corn, weighing 58 lbs. to the bushel, which is at the rate nearly of 6 barrels 2 bushels per acre. Had the mistake not been made in planting the third row, 5 feet from the other two, the 24th of an acre, within a small fraction, instead of the 16th, would have produced the quantity I gathered, for it was evident that the greater distance did not make the third row better than the other two. Sixteen selected ears averaged in length 9¼ inches, and in rows upon the cob, twelve. One of my neighbors, who is an old and experienced corn planter, tried this corn in his garden, and pronuonces it the best for table-use he has ever cultivated, being a very early bearer, and more productive than any of the other dwarf varieties he had seen.

What is both curious and instructive in regard to this corn, is, that although our papers abound with unqualified abuse of it, and its charitable puffer, who certainly deserved some public exposure, not a single individual among the numerous denouncers of himself and his "humbug corn" as one calls it, has deemed it worth his while to report any measurement whatever, either of the ground on which he planted it, or of the quantity it produced; although we ought to presume, that each of them bought it for the express purpose of giving it a fair trial. But if all experiments are to be thus made, I will venture to say, that our cause will derive precious little benefit from them.

Let experimenters always finish carefully, whatever they begin, and our agriculture will continually improve. But it is, to say the least of it, a great waste of time, labor and words, to be writing and publishing such articles as most of those which we have lately seen on this subject: for they contain nothing but mere opinions, evidently written in bad temper, and apparently more for the purpose of letting off the peccant humors of the authors, through the press, (which they have thus used as a kind of safety-valve,) than to furnish any matter really useful to the agricultural community. For any thing that I have yet read, they have tried this unlucky corn by no other taste than its *ill looks*, which is but a very fallacious guide in most things and hence it is that I have commented so freely on the course which they all appear to have pursued—a course, which if generally followed, would render it perfectly useless to make any agricultural experiments whatever.

This year, I have made my first experiment with broom-corn. It was planted 3 feet by 4, and from 3 to 6 stalks left in a hill, on land of ordinary quality. It produced from a part of the ground which I measured, at the rate of 70 or 80 bushels of unclean seed; but having no convenient means of seperating it from the husk, I could not tell how much that quantity would net. The ground received the same culture with the Chinese tree-corn; and this trial has induced me to think, that the grain would be preferable to oats for feeding any kind of stock. The northern farmers who are well acquainted with it, and have ascertained its value by actual experiments, say, that it is worth a third more than oats, and will bring more to the acre. In addition to this, I know that the broom-makers give, at present, $5 a hundred for the brush, stripped of the seed, from which they have contrived an excellent implement, that may be made for two or three dollars, and the stalks yield a considerable quantity of good fodder, although less than our Indian corn. These extra values over oats, (which are not mere matters of opinion but of fact,) are surely much more than sufficient to pay the extra expense of its culture.—Some writer has lately objected to cultivating it, that he thinks it "a great exhauster."—But his opinion seems to me no better than the reason he assigns for it, which is, that "*the seed are oleaginous*." For even admitting both to be true, the objection applies quite as strongly to Indian corn itself, which is also *oleaginous*; and with still greater force to flax, cotton, the castor-bean, pumpkins and squashes, the seed of all which plants produce a far greater quantity of oil in proportion than broom-corn seed.

My experiment with turnips of several varieties, (drilled at different distances,) but chiefly ruta baga, of which I think as highly as any person who has expressed any opinion on the subject, has led me to a conclusion which I now offer for what it is worth. It is, that the practice with many persons, of making the rows 2½ or 3 feet apart, and sowing the seed on the top of ridges formed over trenches filled with manure, is highly objectionable for several reasons. The first is, that between 3 feet and 2 (which appears to me quite enough,) we lose ⅓ in the number of roots, without any thing near the proportionate gain in the size of the last number. This is confirmed by the fact, that the greatest crops ever recorded in our papers have been made from grounds where the distances were less than 3 feet, the wide way. But, even admitting that the gain in size at the latter distance will make up for the loss in number, there is another argument in favor of 2 feet drills or less, which must be conclusive, if those root culturists are right, who assert, that the nutritive matter in all turnips and beets also, *does not increase* in proportion to their bulk. For the the truth of this assertion, I cannot vouch from my own experience; but it is sufficiently important to be well worth investigation. My second objection to the widest distance is, that straight drills, 2 feet apart, may be worked with a suitable plough or cultivator, (of which we have many,) quite as easily, as drills 3 feet apart; but the single coulter, followed by the hand-hoes, I prefer to either plough or cultivator. My third objection applies to ridges and trench-manuring; and it is this: Since our climate has become so liable to excessive drought, all roots, cultivated on high land appear, manifestly, to thrive best on a level surface, such especially, as grow much above ground, which is the case with the mangle wurtsel, the sugar-beet, and the tankard turnip. And, lastly, the manure deposited in trenches, (which operation nearly, or quite doubles the labor of distribution,) benefits the crop only until the fibrous roots of the plants protrude themselves beyond it, as all of them soon do. Even before this takes place, the manure in trenches does not act with near as much power, as when the same quantity, on the same space, is spread broadcast, for the former frequently remains unrotted, and even fire-fanged, when the roots are dug, as I have often witnessed in digging Irish potatoes.

One of my turnip experiments was, to ascertain which acted best of the following kinds of manure—marl, having about 37 per cent of carbonate of lime—undrawn but old ashes—bone dust—fresh cotton seed, mixed with pulverized mortar that had grown hard, although recently prepared—bone dust again—old plaster pulverized—and fresh stable manure mixed half and half with the sweepings around my stable. These were regularly spread in the order in which they are mentioned, in equal quantities as well as I could judge by the eye, and on equal spaces by measure as to length and breadth. Across these spaces I drilled in rows 15 inches apart, seed of the globe or Norfolk white turnip—the yellow Scotch, called the Aberdeen—the ruta baga, and Dale's hybrid turnip, which is also yellow. The seed of the last was at least 5 years old, but came up as well as the rest. Each kind of turnip appeared to be equally benefited by the same kind of manure; but there was an obvious superiority in the growth of all upon the spaces where the bone dust and the cotton-seed, with pulverized mortar, had been applied—between the effects of which two manures I could see no difference. The plants on the marl and ashes spaces were the next best; but slightly better on the latter. The old pulverized plaster, and the fresh horse manure, mixed as above stated, evidently produced less benefit than the other manures. There might possibly have been some little difference in the strength of different parts of the ground on which the experiment was tried; but I perceived none, and the spot being only ten or eleven yards square, my eyes could not have deceived me much. This I mention to show the necessity of the utmost possible accuracy in all agricultural experiments that can be of any real value. Unless thus made, their publication often leads inexperienced farmers into injurious practices, causing the loss both of time and labor, which is virtually a loss of money also.

Before I quit the subject of drill culture, it, may perhaps be useful to some of my brethren briefly to state my own process, as I have found it a very great saving of labor. In making the drills for the seed, I use a marking rake, in which four pegs, an inch square, with sharpened ends, are fixed at the distance from each other, I prefer for the particular kind of seed to be sown. The same rake may serve for two different distances, by having a row of pegs in opposite sides of the timber which holds them. It has two handles whose ends are connected by a cross piece, and by this the sower pulls it backwards, marking in the first instance, four small furrows at once, in which he is guided by a stretched cord that he suffers just to touch the outside peg all the way as he walks. After this, each time of passing the outside furrows serves instead of the rope to keep the furrows straight, but then he marks only three at once. The rake should be heavy enough to make the furrows about an inch deep. In these the seed are dropped from a very simple hand drill, which may be made for three or four dollars, although it will last for a man's lifetime, and is so contrived as to sow seed of any size or shape that will pass readily through a hole; and to perform at the same time, the three different operations of opening the furrow, dropping the seed and covering them. With this drill and marking rake, one man can easily finish the whole work of sowing an acre in a very few hours, and with far greater regularity than can be done in any of the common methods.

In an experiment made with the Rohan potato, the 63rd part of an acre produced seven bushels and three pecks, which was at the rate of 488 bushels per acre. The quantity certainly would have been greater, as the seed would have planted more ground; but fearing a loss by cutting them into pieces having only one eye, many were planted having two or three eyes to each. Even this product, however, far exceeds any yet made in our part of country, from any other variety of this valuable root, and must give Rohan potatoes a decided preference—at least for a quantity, over all the kinds at present known to us. But we may possibly obtain a still more productive variety, since it is now well known, that by planting the apples, entirely new and unknown kinds will continually be produced. I ought to mention that my Rohans were planted 15 inches apart each way, in a level surface, well manured broad cast, and then dug. Twelve of the largest together weighed twelve pounds, and one of these a pound and a half. covered with straw 5 or 6 inches deep; in which state they remained untouched until they were dug. This mode of planting saves all the labor of cultivation, and improves by the straw instead of impoverishing the land.

Here ends my detail of experiments with which I have detained you so much longer than I wished or expected, that I almost fear to proceed, as I heretofore have done, at our anniversaries, to offer you a few concluding remarks by way of caution against prevalent erroneous opinions and practices, and of encouragement to perseverance in all the means best calculated to promote our cause. But since my age admonishes me that it is very possible I may now be addressing you for the last time, this consideration I trust will excuse my proceeding for a few minutes longer.

Among the circumstances which should increase our zeal and animate our hopes in abiding *by* old Virginia forever, is an abatement in many parts of the state, of the mania, (as I always considered it,) for abandoning our native homes, and all that can endear them to us, in search of new, unknown, untried lands, where, in a vast multitude of cases, the design first avowed by most emigrants, of making money for the *sake of their families* is very soon converted into the settled, ever anxious, heart-corroding passion for making it solely for its own sake, to the neglect of almost all the conveniences, comforts, and enjoyments of civilized life. What has produced this abatement of the migrating mania, which to me seems evident, I cannot tell, unless it be, that the newly awakened spirit for agricultural improvement has already so far and happily operated upon most of us, as thoroughly to have convinced us, that even our most exhausted lands are, in general, capable of soon being rendered very productive; and probably at less expense than we should necessarily incur to move to a new country; to erect the indispensable buildings to clear lands for cultivation: and then have to wait some years before we could make any other income, than "hog and hominy." In proof of the great capacity of almost all our lands for speedy improvement, I will here state what has resulted from a small trial of my own soil, although it never was of the first quality. The fields have been cultivated ever since I could first remember, which is more than half a century, in three-shifts, one of which has been annually pastured during the whole time, except for a short period that I followed the inclosing system of my good old friend Col. John Taylor, of Caroline, whom I have always considered as the father of Virginia agriculture, and whose memory will be honored and cherished as long as a single friend to our cause is left in the state, who either knew him personally or by character. But to proceed with my statement; the field in corn this year had a few acres cow-penned last year, and not ploughed up until the past spring, a practice, by the way, which is the result of many trials made by myself and others, that have most thoroughly convinced me of its superiority to ploughing up each pen as soon as it is removed. The corn on these acres was planted in April, the hills five feet by three apart, with one and sometimes two stalks left standing in each. One of these acres which appeared somewhat better than the rest, produced, by accurate measurement, eleven barrels of sound corn. Another acre, (both of twin-corn,) in a different part of the field that had been an old clover lot, but cultivated, with only one or two sprinklings of manure, for several years past in corn, wheat or oats, was also accurately measured, and produced fifteen barrels, within a fraction of a bushel, and this quantity be it remembered, is worth double or triple as much here, as the same would be in most of the new states, Only a short period has elapsed since you could visit scarcely a family of your acquaintance without finding them in distress, at recently parting with some intimate friend, or near and dear connexion, hurrying away to far distant lands. Now, comparatively speaking, it has become a rare sight; nay, I know several instances of individuals and whole families having returned from this voluntary banishment, to their former neighborhoods, determined never to quit them again. If they have been long absent, they find, on coming back, a new condition of things, in many parts of their beloved old state. Improved modes of culture, and zealous, active efforts, in various ways, to restore the fertility of our soils, are causing our much abused and neglected fields, once more to "smile and blossom," as in the olden time; whilst the class of planters and farmers is fast rising, in public estimation, to that rank in society to which the pre-eminent importance of their profession to our national prosperity and happiness so justly entitles them. They themselves evidently begin to feel it, and consequently to cherish a laudable pride in their own improvement in agriculture—not only as an art, but a science also; for there are hundreds of books and papers on the subject, now read and studied, for one that was even looked at, a few years ago; so that the few individuals who, in these times, are silly enough to expose their own ignorance and self-conceit by declaiming against what they call "book-farming," are fast becoming objects both of pity and contempt. These, my good friends, are *all* circumstances truly well calculated to encourage every man among us, who is a real friend to his own native state, never to weary in his efforts for her welfare and happiness, as long as there is a single shot in the locker. But they are especially encouraging to the whole body of our yeomanry, by the proof they afford, that the abandonment of our homes, kindred, and friends is far—very far from being at all necessary to secure every enjoyment that a rational man ought to desire in the present life.

So far for our encouragements to live in and die by old Virginia. But now come the cautions and warnings to which I beg leave to call your attention; for unless *they* are duly regarded, none of these encouragements can be rendered available to any great extent. First then, beware of adopting the conceit, which is so common, that we already know enough of any branch of our profession to supersede the necessity of striving to know more; for it certainly produces the practice, (if standing still can be so called,) of stopping short in all efforts at improvement; whereas, there is no calculating the extent to which this may be carried, if we would only act with the same common sense that we do in regard to the preservation of life. *This* we anxiously endeavor to prolong, as well as to increase the means of enjoying it, notwithstanding we are perfectly certain that all must die, although we know not when. Why, therefore, should we not also strive to increase the means of improving our profession as one of the chief sources of our pleasures, since every one believes this *may* be done, although all are equally ignorant of the extent to which these means may be carried; and none can tell but that there is a point of improvement far beyond any thing ever yet attained, even by the most skilful and best informed agriculturists of the world? Would we constantly act under a thorough conviction of this fact, our husbandry would soon reach a degree of perfection which the most sanguine amongst us have hardly ever yet formed, even a faint conception.

Another caution which seems every day, to become more and more necessary, is, to guard ourselves most anxiously, against that inordinate passion for the rapid accumulation of wealth, which tempts us to rush headlong into new modes for acquiring it—modes of which we are utterly ignorant although we often suffer ourselves to be seduced into them by humbugs—so excessively extravagant, that we could not fail to see them in their true light, if the baneful lust of wealth did not make us stone-blind to their absurdity. I would here quote that wisest of men, king Solomon, against those who "*hasten to be rich;*" but it seems hardly worth while; for as most of his admirable lessons of wisdom have generally been disregarded, for more than two thousand years, it is hardly probable that *we*, of the present day, should obey them any better, than the millions upon millions who have lived and died before us. But there is *one* argument, I think, in support of my caution, that comes home to the selfishness of us all, and is so plain that he who runs may read it. Let us ask ourselves what proportion of our brethren has ever become rapidly very rich by cultivating the soil in any thing whatever? Is it one in a thousand, or one in ten thousand? If not, ought any man in his sober senses, to venture in a lottery where the blanks to a prize are ten thousand to one? Common prudence and common sense would, at once, answer no—never. The worst of it is, that as high seasoned viands and strong liquors, if long used, create in our *stomachs* a distaste for plain, wholesome food; so these enormous profits, although only in expectancy, by an almost countless majority, excite in *their minds* a similar distaste for the comparatively slower, but far surer profits of our ordinary husbandry; although *this*, if judiciously and industriously pursued, will, more certainly procure us all the conveniences, comforts, and rational enjoyments of life, than any other employment that we can possibly pursue. Even in ages long past, when husbandry was, almost, in its infancy, one of the best and most celebrated of the Roman poets—in his enthusiastic admiration of our profession, exclaimed—

"Oh! fortunati nimium, si sua bona norint!"
—Oh! too fortunate, if they were only conscious of their own good!"

The incontestible proof that *this* is generally deemed the best of all professions, is, that all men, (with very few exceptions,) strive to become, ultimately, owners and cultivators of the soil. *This* was man's first occupation, and seems to be destined by God himself, to be estimated, throughout all ages, as the chief source for supplying his wants—augmenting all his innocent pleasures, and ministering to his happiness, so far as the things of time and sense can contribute to promote it.

I could here give a most edifying history of the latest of our humbugs. But too many of our shoulders have been recently wrung by it, and the galled places are still smarting too much, for the recital now to do any good, I therefore forbear, for the present; but will certainly give it, (if alive,) upon the earliest threatenings of a similar visitation.

The last of my warnings and cautions which, above all others, I would most earnestly press upon your attention, is against a moral disease of such universal prevalence, that it affects every class in society, but ours, I think, most injuriously; for I consider it the chief cause of the numerous emigrations heretofore made by our brethren to the new states and territories. In a word, it is the disease of *extravagance*—of *expenditure beyond income*. It may perhaps, appear both foolish and presumptuous in any single individual to offer even one word of admonition in regard to any moral disease whatever, which is so widely spread as nearly to destroy all hope, either of mitigation or cure. But the less the hope, provided there be any left at all, the greater seems the necessity, and the more imperative the duty of exerting ourselves for its removal. I must beg leave, therefore, to offer *my pittance* of advice and prescription in a case of such vital importance to us all.

Having ascribed the numerous desertions of our lands by their former proprietors, chiefly to our increased, and still increasing extravagance, permit me now, concisely to offer the proofs. None, I think, can truly deny, that the whole cultivated lands of Virginia produce more income than they formerly did; either because more surface is under tillage, or its culture better, or the efforts have been greater and more successful to improve it. Why then the supposed necessity for emigration? Simply because our expenditures in household and personal expenses, in dress, furniture, equipage, but above all, in our vagaries over the face of the earth and the waters in steamboats and rail-roads, without any apparent object, (unless to be idle, and to escape from our domestic duties,) have increased *geometrically*, while our landed income has augmented only in an *arithmetical ratio*. In other words, we agriculturists in general, now spend dollars where we formerly spent cents. Add to all this, our boys, poor fellows! are not unfrequently left, nay often encouraged, to spend their time and large portions of the family income, in assiduous efforts to spoil God's own image by preposterous and deforming fashions, and in playing the man, while yet mere children; instead of being trained to aid their fathers in all their farming operations. Our girls, God help them! are no better managed, in cases innumerable; for multitudes of them are taught, long before they are out of their teens, to ape all the airs of fashionable women, to electioneer for husbands, in any way that promises success, at all places of fashionable resort, often on borrowed funds, for which their fathers' lands have ultimately to pay; whilst they should be assiduously seeking physical and intellectual improvement at home, and taking lessons from their mothers in that most essential and comprehensive art called "*house-keeping*," without a competent knowledge of which no woman is fit to become the mistress of a family. All this utter waste of time, of landed revenue, of the intellectual and bodily labor that might be applied to augment it; all this abuse of God's best gifts goes on amongst hosts of our brethren, in a vast multitude of cases, apparently without any looking either forward or backward. The farming profits having long vanished, give place to dealings upon "credit," until the sheriff calls for taxes; or the convenient, accommodating retailer of goods, comes down upon them for *some small matter, a few dollars only, if not convenient to pay the whole account*; the annual, but very unnecessary tribute paid to northern importers, for goods which our Virginia merchants could just as well import for us, if the want of foresight in themselves, and misgovernment in our rulers, had not prevented it. *Then it is*, that the paroxysms of the emigrating fever seize us; *then, it is*, that, you hear the cry: Oh! we can't live here any longer, we must move to a new country; our lands are worn out past recovery, they will not furnish salt to our bread! and away they scamp in thousands of instances, without having e seen, or possessing the slightest knowledge eit of the country to which they are going, or t character of its population, abandoning forev their native homes—although in reality, they quire nothing under heaven, but a few years of dustry and economy, to yield them every con nience, comfort, and enjoyment, that rational m ought to desire.

Having exposed to you, as forcibly as I c the errors and the evils which vitally concern prosperity as a class, perhaps you will expect to suggest a remedy, if any can be found. I as that it must originate *with*, and be applied *by* masters of families, for *they* generally may be c sidered the heads of the same, although the e ceptions are numerous, *wherein*, according to vulgar saying, "*the grey mare is the better hors* This is generally spoken in bad sense, indica of a devilish temper and untameable tongue the mistress, and a chicken's heart, and das spirit in the master; yet to the shame of our se be it said, the expression is too often true in a go sense, for every one has seen many instanc where the whole burden of family affairs has volved on the poor wife, from the utter worthles ness of her husband, and where *she alone* ha proved the main stay that preserved all from irre trievable ruin. Many, very many of these cas are as pitiable as they are real, and cry most lo ly, for that reform, which, as I before said, sho commence with the masters of families. Let them *then*, only begin, for if they are idle and waste they have no right whatever to expect or req any thing better of the mistresses. Let the ma ters then, only take their proper station, and act it constantly as they should do, and most sincere do I believe, not only that all these worthy an excellent women of whom I have last spoken would gladly confine their labors within their ow proper sphere of action, but that they would b able to incite multitudes of their own sex to follow their highly laudable example. For, thank heaven! we still have left enough of the descendants of the genuine old stock of Virginia wives, in every class of our society, thus to honor the memory of their mothers and grandmothers; and to hand down unimpared, untarnished, all those domestic virtues which adorned their characters and rendered them inestimable blessings to their families. Those virtues all still live as perfectly fresh in my memory, as if the admirable possessors of them whom I can first remember, yet lived among us, and God grant that they may never, never be forgotten by any of their posterity.

Could the reform I have spoken of once begi with the masters of the household, not even a shadow of doubt, I think, could exist but that a vast majority of them, instead of having their wives to aid them in wasting their common funds, would find them always ready and most willing to co-operate, with heart and hand, in every act of useful retrenchment, of domestic economy and good management, which promised to promote the comforts, the enjoyments, and the happiness of their homes. *Then*, my good friends, but a few years would pass away, before we should witness peace, plenty and joy in numerous families where we now behold little else than painful struggles against poverty, and vain, cowardly efforts to keep up a show to the last, until the final severance from friends, country and kindred is forced upon them by their own most culpable improvidence. Then, ere long, we should contemplate with deep and delightful emotion, the old dwellings of our long buried ancestors, rapidly repairing, instead of tumbling into shapeless ruins; or their bricks and stones, like some that once were parts of our venerable churches, converted to the meanest purposes. *Then*, would our love of country soon receive a new impulse; a vivid encouragement from beholding our long worn out barren wastes converted into fertile fields, teeming with luxuriant crops; and to cap the climax of well-earned, perfectly justifiable pleasure, we who have resolved to live *in* and die *by* our mother state, might continually exult in reflecting that *all this* has been *our work*. In a word we should soon behold so happy a change wrought over the face of the whole country, as well as in its people, that a true-hearted Virginian would almost as soon think of committing suicide as of giving up his native home—the graves of his parents, relatives and friends—all that from his childhood he was taught to hold most dear, for any new state or country on the face of the earth.

And now, my brethren, one and all, I must bid you farewell, perhaps—and not improbably, for the last time. Should it be so, listen, I pray you, to my parting entreaty: cherish our society; keep it up; and however feeble may be the encouragement given to it *here*, where it should surely meet with most; however small may be its annual accession of members, let the few faithful friends of our cause constantly bear in mind the all important fact, that there is no other way yet devised so well calculated to promote the husbandry of this or any country, as that of organizing and maintaining, in the proper spirit, *societies of agriculture.*

PREMIUMS AWARDED BY THE AGRICULTURAL SOCIETY OF FREDERICKSBURG.

Annual meeting, November, 1839.

The premiums were awarded as follows, viz:

To Garland B. Taylor, of Louisa county, for his common blood stallion, Expunger,	$10
" J. Cole Dickinson, of Louisa county, for his mare, Bett Badger, - - - -	10
" A. B. Hooe, of King George, for his three-year old filly, Tranquillity, -	10
" G. B. Taylor, of Louisa, for his riding horse, - - - - - - -	10
" John Stuart of K. George, for his jack,	10
" George Hamilton, of Spottsylvania, for his mule colt, - - - - - - -	5
" Thomas Scott, of Orange, for his bull, Boliver, of the Durham breed, - -	10
" John Ferneyhough, of Spottsylvania, for cow, of the Alderney breed, - -	10
" F. W. Taliaferro, of Spottsylvania, for grass fatted beef,* - - - - -	5
To George Rowe, of Spottsylvania, for the best ram, - - - - - -	5
" Wm. C. J. Rothrock, of Spottsylvania, for the best ewe, - - - - -	5
" George Rowe, of Spottsylvania, for mutton.†	

Domestics.

To Mrs. Dickinson, of Louisa, for the best suit of clothes, of domestic manufacfacture, the same having been worn by Mr. Dickinson at the fair, - -	$10
" Mrs. Virginia Scott, of Orange, for a carpet, - - - - - - -	5
" Mrs. Hamilton, of Spottsylvania, for a piece of negro clothing, - - -	5
" Miss Stevens, of Stafford, for a piece of plaid, - - - - - - -	2
" Mr. Lyon, of Fredericksburg, for 4 oz. sewing silk, - - - - - -	5
" Mrs. Hunter, of ditto, for a pair of silk hose, - - - - - - -	2
" Miss E. Richards, of Culpeper, for a pair of worsted hose, - - -	1
" Mrs. Mary Rothrock, of Fred'g, for a cotton counterpane, - - - -	3
" Mrs. Mary E. Brooke, of Spotsylvania, for a yarn counterpane, - - -	3
" Mrs. Mary Rothrock, of Fred'g. for a piece of domestic flannel, - - -	5
" Miss Went, of King George, for a quilt,	2
" Miss Bond, of Essex, for a cap, (discretionary premium,) - - - - -	5
" An orphan girl, for a beautiful tippet, made of ducks' feathers—a discretionary premium of - - - - -	5
" Mrs. Mary Rothrock, for a piece of jeans and piece of linsey, each - -	1

Vegetables.

To Doct. E. P. White, of Caroline, for the best Irish potatoes, - - - -	$5
" John Ferneyhough, of Spottsylvania, for the best beets, - - - - - -	5
" Wm. Jackson, of Fred'g, for the best cabbages, - - - - - -	5
" Wm. Jackson, of ditto, for the best celery, - - - - - -	5
" Wm. Jackson, of ditto, for the best salsify	5
" Wm. Jackson, of ditto, for carrots, -	5
" Robert Ellis, of ditto, for parsnips, -	5.
" J. Ferneyhough, of Spot'a, turnips, -	2 50
" John R. Spotswood, of Orange, for apples, - - - - - - -	2 50

JOHN S. CALDWELL, *Sec'ry.*

RUTA BAGA AND THE GARDEN FLEA.

From the Farmers Monthly Visiter.

Mr. Editor.—I believe it is a principle at common law that no man shall profit by his own misdoings; but laws are not always just, and there are few principles which do not admit of exceptions.

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* The committee on grass-fatted beef, reported that they would have awarded the premium to Mr. Lewis Shumate, of Fauquier, if his cattle had been entered in time.

Mr. F. W. Taliaferro, to whom the premium was given, presented it to the society.

† The committee on mutton, reported that they would have awarded the premium to Mr. John B. Gray, of Stafford, if his mutton had been entered according to the rule of the society.

Last spring I planted about half an acre of ruta baga, on land that was manured with long manure from the barn-yard, and before the plants got fairly started, the weeds got ahead of them, and being busy about other matters, I neglected to hoe them until they were completely overrun with weeds; and seeing my neighbors' plants entirely devoured with the garden flea, I felt but little disposition to neglect other work to weed mine, from the impression they would meet the same fate. One day I discovered a few straggling plants making their way through a thin spot of weeds, which induced me to examine the piece. I found the plants to be perfect and entire, not one having been molested by an insect of any description. I hoed and thinned them out, and in ten days I had the handsomest and forwardest yard of turnips in the town, and I have no doubt that by my negligence in not hoeing them, I have gained over one hundred bushels of fine roots. Many of my neighbors will not have forty bushels from a piece as large as mine, while I shall probably get two hundred. I would therefore suggest whether neglecting to weed turnip plants until the 20th or 25th of July, will not prove an effectual safeguard against the depredations of those insect intruders. CYRUS SLACK.

PROMISCUOUS REMARKS.

For the Farmers' Register.

The maturing of corn hastened by early ceasing to cultivate the crop.—In the October No. of the Farmers' Register, page 588, a Fairfax cultivator treats on the above-mentioned subject, in a recommendatory manner; from which I beg leave to dissent. Taking into the count both latitude and departure, my locality is about equal to that of Fairfax, and I am certain I have ever profited by cultivating my corn to the 10th or 15th of July. About 25 years past, I cultivated a crop of corn till about the 10th of August, which proved to be too late, although planted at the usual time; for it was caught by frost. Would the author of the above communication please spare a few more moments, by responding to the following. What kind of soil was your crop on? What kind of corn was planted? Do you suppose the produce was equal to what it would have been, had you given late tillage? If the produce was less, do you suppose the "saving of time" was equal to the loss of grain? By early ceasing to cultivate, would not a host of weeds and grasses appear to the injury of the crop, and to the impediment of putting in small grain? Never mind Mr. Fairfax, this stricture may be of service, both to you, myself, and the community; particularly if said stricture may be refuted. Your laying out, and cultivation of the corn crop, is my practice on porous levels.

My own preparations and intentions for 1840.—Nearly all the ground intended for corn next year, was fallowed in July, August, and September last, and is now in oats, rye, and wheat, either sowed or volunteer; which has been grazed, and the grazing will be continued till spring. The oats are yet green, are the best grazing, and will not be killed by the frost till about Christmas. I shall not cultivate more than one-third of my usual quantity of ground in corn, but by neat tillage, I intend to make my usual quantity of bread. My attention is much turned to grazing, therefore grass, oats and rye, both green and cured, are equally as important as corn. (The word maize, is with us nearly obsolete; we say corn, wheat, &c.) A few days past I finished spreading on my intended corn-land, the remains of my last winter's stock of manure, amounting to 242 heavy ox-loads; and next spring the remainder of the plat will be manured with the accumulation through the winter, of the cow and horse yards. My mode of depositing the loads, is according to the rule of Col. Taylor, as laid down in his Arator; and the piles are not spread till there is much likelihood of rain. After a soaking rain, I believe there is but little, if any evaporation at this season of the year. Indeed I have spread manure in the months of August and September, on a stubble or other unappropriated field, and supposed that I had sustained no loss.

My bottom lands are fallowed and put in some crop nearly every year, (meadows excepted.) Those crops are, promiscuously, Indian corn, wheat, rye and oats; and whenever and wherever any of the small grains fail to produce a profitable crop, they are turned under for improvement. So soon as those grains begin to ripen, this operation is performed, and if seasonable, heavy second crops may be expected. I sometimes sow rye after rye, wheat, corn or oats; oats after oats, rye, wheat, or corn; wheat, after corn or oats. I also sow some millet, which shall go hereafter in part to improvement.*

I am now collecting, and intend to collect a goodly supply of tobacco stalks, and other tobacco offal, which are to be ground in a bark mill if practicable, if not, pounded in a trough, to be used as manure, a handful mixed with gypsum, in each corn hill.

The whole of my corn crop is intended to be watered from a creek; the greater portion of the ditches have been made and used for this and other purposes for fifteen years. So soon as the culture of the crop is over, the water is let on the fields, and the corn at this stage of its growth is much benefited thereby. Natural grasses grow so luxuriantly amongst the watered corn that there is no chance of seeding either fall or spring, till the fallow plough has been used. I have never yet sowed any kind of small grain at the last dressing of corn, to be watered for the purpose of grazing; but am inclined to think that rye and oats would answer the purpose; either of which would head before winter.

Although I am not running for a premium, other than that offered by my corn crib, yet I am very solicitous to do my duty—to do my utmost. Many of my neighbors already laugh at me for being a book farmer, although they cannot laugh at my crops; now if I fail of a great crop or a small space, they may have just cause for laughing. I am at a loss to determine on the proper tillage before culture, and beg leave to call on Mr. Ruffin to assist me in this dilemma. My corn plat is generally a strong loam; now shall I plough it immediately, again in March, and again immediately before planting? Shall I plough it twice, and when? Or shall I plough only once, and when? Shall I use the cultivator and harrow, and when? The ground is already well pulverized, and from this time till April, a considerable flock of sheep will be on it.*

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* Our correspondent will render good service to the cause of agricultural improvement by furnishing particular and detailed statements of the operations which he here mentions generally. There are but few subjects of more importance than green manuring, and none on which there is less information.—ED. F. R.

Oat pasture &c., by W. Young.—It was this writing of Mr. Young, which first started me to making experiments on oats, and I am pleased to see the publication in the Register, this being sufficient evidence of the editor's approval. I know thar the editor will excuse me for the following correction, October No., page 583, for "it is to be expected, &c.," read, "it is not to be expected, &c." See Memoirs Phil. Agr. Soc., page 194, vol. ii.

Judge Peters says in unqualified terms, that the oat crop is a great exhauster. I wish I were half so good a farmer as Judge Peters, but with due deference to his better judgment, I beg leave of his honored ashes to say, that oats on clay is an improver, until by oats, the clay is made sufficiently porous for the production of other crops.

Beets.—This year, I cultivated three-fourths of an acre of ground, on the top of a high mountain, in beets, which produced about 429 bushels. They were sowed quite late in consequence of which, and the then drought, they were not over half thick enough; and the after drought must have reduced the production at least 50 per centum. Thus, it is found that I made at the rate of 560 bushels to the acre, but under favorable circumstances, I would have made nine or ten hundred bushels. They were on black virgin soil. The greater portion was white sugar beet, second, mangel wurtzel, third, yellow sugar beet. The white was best, yellow second, mangel wurtzel sorry; which inferiority in the last mentioned I attribute wholly to deception in seed. They are intended for hogs, and are now secured. The patch being some two or more miles from any residence, I much dreaded their destruction by wild animals, but they were not touched.

I again solicit the editor's attention and remarks on my intended corn crop, or any, or all this hasty scrawl. MOUNTAINEER.

Amherst, Nov. 11th, 1839—Snow storm from east.

BOTS IN HORSES. MURRAIN IN CATTLE.

From the American Farmer.

It is the duty of every person who has any experience in the treatment of diseases in that noble and useful animal, the horse, to communicate it to the public.

It was my province a few years since to have much to do with that noble animal, and of course among the number in my possession, I would find a number that would be diseased, and very often my skill and experience would be taxed to find a remedy for some of the diseases to which they would be very often subject.

The most formidable disease to which this noble and useful animal is addicted, and there is none more alarming in its attacks, is the bots.

I had consulted the highest authorities in the veterinary art for the treatment of this disease, and faithfully used the remedies laid down, without any benefit. I was induced from interest, and also for the very high regard which that noble animal, the horse, held in my estimation, to use every expedient in my possession, to cure this formidable disease. I had another motive—I had lost several very fine horses by this disease, which induced me to use and try every experiment which my ingenuity could invent, to arrest this disease among my horses, and prevent if possible, its recurrence among them.

I am satisfied, and feel convinced, that I will offer to the public, an infallible remedy for the bots.

Some six years since, I purchased a very fine horse, but had the appearance of laboring under some disease. I commenced a course of treatment, which I thought would relieve him, and which I had pursued in the treatment of some other horses which had the appearance of being diseased in a similar manner to the above mentioned horse, with decided relief; but in this case all my remedies failed of their desired effect.

I was induced to try the use of lime in the treatment of his case, as I was confident he was filled with grubs or bots, as he had discharged several. I commenced by giving him a tablespoonful of slaked lime three times per week, in bread mashes. After pursuing this course near two weeks, the bots began to pass off in quantities varying from 10 to 20, which he would expel during the night, from his intestines. In the meantime his appetite began to improve, and in six weeks he was one of the finest looking geldings I ever saw. From that day to this, I have kept up the use of lime among my horses, with decided benefit. As an evidence of its good effects, I have not lost a horse since I began to use it.

A large number of the bots which he would expel from his intestines, had the appearance of being dead. I was induced from this fact, to put some of them in a strong solution of lime-water, as I had frequently put them in spirits of turpentine, without producing any effect on them; but all those that I put into lime were perfectly dead in eight and forty hours.

Lime is a certain preventive in keeping cattle from taking the murrain. As an evidence of this fact, I have used it among my cattle three times per week, mixed with salt, for three or four years. In that time, I have not lost a single cow, or steer, or ox, by this disease; in the meantime, some of my neighbors have nearly lost all the cattle they owned.

I will give you a stronger case than the one above mentioned. One of my neighbors who lost all his cattle, had a neighbor living within two hundred yards of him, who had several cattle which ran daily with those that died, and his cattle all escaped. He informed me he made it an invariable rule to give his cattle salt and lime every morning.

I have no doubt it is a sure and infallible remedy for bots in horses, and a preventive of murrain among cattle. J. W. J.

Red House, N. C., Nov. 16th 1839.

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* There are too many circumstances involved in the case submitted, and some of them too imperfectly known, for us to presume to offer any opinion, or answer to the above questions.—ED.

DIARRHŒA IN HORSES.

From the Franklin Farmer.

Mr. Editor.—Some days past, a person, who, doubtless, had heard that I could advise him what to do with a colt taken with a looseness of bowels: after having satisfied him as far as my knowledge permitted, I thought that the information might be serviceable to others. Colts are subject to the diarrhœa two or three days after their birth, like children, by the accumulation of matter in the intestines during their stay in the womb. Their excrements are yellow and fœtid. This evacuation is accompanied by a failure of appetite and weakness, lasting for a short time. If the looseness continues, the colt becomes very poor and dies. These accidents often proceed from the unhealthy state of the mare, or a too great indulgence of green food towards the last two or three months before foaling. It may have been observed that all the horses permitted to pasture in the spring, or fed on green grass in the stable, are more or less subject to a diarrhœa, which in most cases stops of itself after having purged naturally the animal; but in other cases it may become inveterate and and fatal, according to the previous state of health of the animal, who might have had a beginning of that disorder, which is often the case after foaling or abortion. It is prudent to watch closely and guard against a diarrhœa that lasts more than two or three days, but avoid to contradict nature, which might produce worse consequences, for this looseness is caused in foals and (calves) by the purging quality of the mother's milk. When, however, it lasts too long, I use for colts from 3 to 4 oz. of rhubarb mixed with molasses or endive syrup, or assafœdita, for three or four days only; one ounce of this last for each dose diluted in warm water. If the colt is older, the disorder may be caused by worms, in which case chimney soot in new milk, from half an ounce to two ounces according to the age of the colt, should be given to him. When the diarrhœa attacks a full grown horse, it is often necessary to purge before stopping the disease, and to consider what was his general health previous to that particular disease.

W. MENTELLE.

REMARKS ON FRUIT TREES.

From the Franklin Farmer.

The following are equally appropriate to apple and pear trees. Those trees, in order to last long and bear well, should be dug about one foot deep and two feet around towards the end of October. The dry and dead limbs and the bad ones cut off—the outward rough and creviced bark carefully scraped, either with a rasp or any instrument for the purpose. This may be done in February, taking care not to hurt or damage the inner bark; if the live bark be touched, the wound should be covered with an ointment made of cow dung and clay mixed together with urine. This will do well also to apply upon those parts of any tree that have been pruned. The hole around the trees must be filled up early in March with new earth. The peach tree must be pruned at the end of the winter, and the wound to be covered with the above composition. Nature has designated the most proper time to plant the best peach stones; as those which fall on the ground when the fruit is ripe, and are buried by hogs or any thing else, must certainly grow better than if we plant the dry seed which we generally plant without success. As soon as you see and eat such peaches as are worth having, put the kernels in the ground, in a trench of six or seven inches deep, cover them well and they will all or nearly all come up the following spring. To rub a pear or apple tree with [illegible] after scraping, is, I think, advisable, as a pear tree 5½ feet circumference, thus treated, has revived this year, and instead of an almost dead condition, was of superb foliage and bore fine fruit which it had not done for the last three years.

W. MENTELLE.

PROCEEDINGS OF THE NORTH ANNA AGRICULTURAL ASSOCIATION.

To the Editor of the Farmers' Register.

The inclosed communications were made to the North Anna Agricultural Association, at a late meeting. In compliance with a resolution adopted by that association, I now transmit them to you. Should you be of opinion, that a publication of them will in any respect promote the interests of agriculture, you are at liberty to give them a place in your valuable periodical.

Very respectfully, I am,
Your obedient servant,
W. HOLLADAY.

December 3rd, 1839.

Cultivation of sugar beet.

To the Chairman of the North Anna Agricultural Association.

In compliance with a regulation of this association, I make the following communication on an experiment made by me during the present year, in the cultivation of the sugar beet.

The ground selected for the purpose was a lot containing 29,123 square feet, (63 square feet more than two-thirds of an acre,) on which for more than twenty years my hogs had run a part of the time I was fattening them. Throughout this period the lot had borne *annually* a crop of Indian corn, intermixed with beans, peas, and Irish potatoes. Nevertheless the land had been kept in good condition by what came from the hogs, and I gave no additional manure to it. The greater part of the lot lies sloping to the south-west. The soil is what we usually call gray, with a good substratum of clay.

Not having determined to cultivate the beet until early in the spring, I had neglected to have the lot ploughed as soon as it ought to have been. The land was still hard from the trampling of the hogs. In the month of April, after a rain, it was coultered as deep as two strong horses could pull the coulter; nearly up to the beam of the plough. It was then ploughed to about the same depth. After this it was harrowed with a heavy harrow drawn by two horses. By these different operations the land was brought into good tilth. To prepare it for the reception of the seed, ridges were thrown up, about two feet and a half apart, by turning together two furrows of a large plough. A harrow was then drawn upon these ridges lengthwise, by which they were considerably flattened. Having no drill-barrow, I adopted the following expedient for the purpose of distributing the seed equally. Pins were driven into the wheel of a common wheel-barrow, pointing towards the centre, at such a distance apart, that when the wheel-barrow was rolled lengthwise on the ridges, small holes were made upon them by the pins seven inches and a half apart. Into each one of these holes a single seed (I should rather say capsule*) was dropped by the hand, and covered with fine earth to the depth of nearly an inch. This was done about the middle of April. Previous to sowing the seed they were put into warm water, and soaked for twenty-four hours. A small quantity of ashes was then intimately mixed with them, for the purpose of separating the seeds. The season being uncommonly dry, they germinated slowly, and came up badly. So unpromising indeed for some weeks was the appearance of the beets, that one time I had thoughts of ploughing up the lot, with a view of cultivating it in some other crop.

When the beets were large enough to be distinctly seen, the intervals between the rows were ploughed with a shovel-plough drawn by one horse; the hoes followed, care being taken to pull up with the hand every weed and spire of grass near to, and around the beets. In this manner they were weeded, at proper intervals, three times; though I do not know that the third weeding was necessary. On the second day of November the beets were taken up. This was done by running a single furrow of the plough on each side of every row of the beets, and then pulling them up with the hand. The product was at least *six hundred bushels;* nearly eleven ox-cart loads of fifty-six bushels each.

I have said that the lot contained 29,123 square feet. There are on an acre of land 43,560 square feet. Consequently the lot produced at the rate of eight hundred and ninety-seven bushels per acre. Nothing has been guessed at; the beets were measured,† and the lot carefully surveyed. The product would have been greater, if the beets had stood well. In various parts of every row there were spaces of eight or ten feet with not more than four or five beets. In addition to this disadvantageous circumstance, a strip of flat land on one side of the lot was made much too wet for the beets, by repeated rains in the latter part of July, and throughout the month of August. On this strip the beets were very small, and added but little to the product of the lot.

Chaptal, the eminent chymist, and practical agriculturist, after an experience of many years in the culture of the beet, thus expressed his opinion of it: "I believe this plant may be cultivated as food for cattle, more advantageously than any other."‡ I can say from experience that cows fed on the sugar beet yield rich and well tasted milk. A peck of the beets given in the morning, and as much at night, with other ordinary course food, is a good allowance for one cow. Six cows then will consume three bushels in one day, or six hundred bushels in 200 days (6 months and 20 days.) How much Indian corn per day will make the milk of a cow as valuable, as will two pecks of beets, due allowance being made for the quality and quantity of milk? I am confident that no injustice will be done to the corn, by supposing that half a gallon given in the morning, and as much at night, with other ordinary coarse food, will make her milk equally valuable. Six cows then will consume six gallons of Indian corn in one day, or 1200 gallons in 200 days. To produce 1200 gallons, or *thirty barrels* of corn, at least three acres of land, as well manured as that cultivated in beets, will be required. According to this calculation, the product of about *two-thirds* of an acre in beets will go as far in feeding milch cows, and yield as great a profit, as the product of *three acres* in Indian corn. How great the superiority on the side of the beets, and what a saving of *manure*, of *land*, and of *labor!*

Almost every farmer in this part of Virginia must have felt the want of some root crop for his live stock, during the winter months and early in the spring. I know of none so well adapted to our climate as the beet. It is less injured by the long droughts of summer than any root that I know, and produces a larger crop. The late able conductor of the 'Cultivator,' I think, doubted the propriety of cultivating this crop in the southern states; believing the country "north of 42" to be the favorite region of the beet. The experiment, which is the subject of this communication, shows, that on soils *adapted* to the beet, and *well* manured, even *here* about the latitude of 38, as much as eight hundred and ninety-seven bushels per acre, in seasons as favorable as the last, may be reasonably expected; or, supposing the beets to weigh on an average 50 lbs. per bushel, rather more than *twenty* tons; an amount of product *much more* than sufficient to compensate the farmer for the labor and attention bestowed on it. But let it not be forgotten, that good preparation and careful culture are absolutely necessary to success. "The produce of a field which is well taken care of," (says Chaptal,) "is at least double that of one which is neglected."* W. HOLLADAY.

Spottsylvania, 28th Nov., 1839.

ON UNDER-DRAINING.

To the Chairman of the North Anna Agricultural Association.

I have thought proper to bring the subject of under-drains to the notice of this society, having myself experienced some loss of labor from the want of them, as well as profit from their use.

It is well known to you, sir, and to all present, that wet *sobbed* land, while in that condition, is generally the most unprofitable portion of the soil to its owner. If he attempts to derive a profit from it by grazing, its product, being very rough and coarse, is rejected by every species of stock, so long as they can get a tolerable supply of that which is more tender and succulent. Only when pinched by hunger will they resort to the product of such land. If he attempts a profit by culture without draining it, his effort will be in vain. Should he leave his drains open, they (being small) will, after a winter's freeze, and a summer's rooting of the hogs, be nearly filled up. Consequently before he can plough again to profit, he must re-open his drains, and so continue to do at every rotation.

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* One capsule contains generally more than one seed.

† The body of the cart *even* full contained 56 bushels. The loads were *heaped*.

‡ Chemistry applied to Agriculture, page 130.

* Chemistry applied to Agriculture, page 321.

My method is to make the drains eighteen inches wide at the top, eight at the bottom, and eighteen deep. I cut the drains at the lower edge of the hill, and fill them to the depth of ten inches with rocks of any description, except very large ones, thrown in promiscuously; reserving such as are flat for a top layer to prevent the earth from getting through. I then put on a layer of shavings, if convenient; if not, inverted sods. (The rush dug up with the roots answers very well.) The earth, which has been dug out of the drains, is then drawn back; and the work is done for years, and for aught that I know, for ages.

I would recommend in all cases to commence filling at the upper end of the drain; and should any earth fall in below the rocks, let it be removed; and also the thick mud that may accumulate before filling in with the rocks.

The advantages of drains thus made, Mr. Chairman, are briefly the following. The work once done is permanently done; the higher lands above the drains are cleared from the obstruction of rocks and stones; the mud below becomes dry and tillable; and the hopes of the farmer are more than realized in the abundance of his crops.

L. JOHNSON.

November 28th, 1839.

HOW TO DRY PUMPKINS.

From the Maine Farmer.

Mr Editor:—Perhaps it may not be generally known that the more expeditious, as well as economical method of drying pumpkins for domestic use is in the following manner. Prepare the pumpkin and stew it the same as for immediate use, then lay it on trenchers or tiers and dry it (not bake or scorch it) before the fire, or in the oven moderately heated, after baking. Care should be taken after it is dried to keep it as much as possible from damp air in wet weather, otherwise it may mould. All that need be done to prepare it for use is to soak it in milk or water some six or eight hours previous to its being wanted. It should not be spread out like a Jennie cake on the tin, but rolled after the manner of biscuit, as it will frequently be necessary to turn it while drying. The above is communicated at the request of a good housewife whom you may call PRISCILLA.

West Sidney, Sept. 1839.

BRIEF NOTICE OF INDIAN KEY, WRITTEN BY A YOUNG GIRL.

Communicated for the Farmers' Register.

Indian Key, T. F., Nov. 15, 1839.

The islet of Indian Key, is situated in latitude 24° 48', longitude 80° 55', distant from the gulf stream 6 miles, from Key West, 19 north and 60 east, from Cape Florida, 53 south and 35 west, and from Cape Sable, 13 south and 14 east. It was settled in 1824. At that time it was remarkable for nothing but a battle, fought between the Indians and a French crew that had been cast away, in which the French were horribly murdered, and from that circumstance it took its name. It is composed entirely of coral rock, and is of only 12 acres in extent at low water. The south-east side is composed of rugged rocks, but these are not destitute of verdure; in the fissures of the rocks a saline succulent plant, known under the name of *sesuvium*, takes root and brings a vine, soon covers a large part of the otherwise barren rock; it is much like the barilla. The remaining part of the island, instead of being covered with grass, is carpeted as it were with an aromatic herb called tea binkum, resembling the thyme of the north; pepper grass in a wild state is also abundant. The common weeds are the periwinkle or Madagascar rose [*vinca rosea*,] the yellow prickly poppy, [*argemone mexicana*,] the white prickly poppy, and different varieties of the morning glory. On a Christmas morning, instead of a waste of snow greeting our eyes, we look only upon *ever blooming, ever green foliage*. On the north-east side of the island, extensive wharves are built out; on the west is a sandy beach with a large sea side grape tree, [*coccolopa urifera*,] whose roots are even washed by the flowing tides; the fruit tastes much like the cherry, but grows in clusters like the grape. On the south there is a large hotel, which is now open for the accommodation of travellers; and from the salubrity of the climate and the pleasantness of the island, which has been happily styled a "*gem of the ocean*," affords an inviting resort for invalids from the north. Near the centre of the island, there is an open square which I suppose might be denominated the village green; on the north-east side of the green, are built four very neat cottages and a large store; on the western side, is the dwelling of the inspector of the port, whose yard is well stocked with morus multicaulis trees which are covered with their luxuriant foliage the whole year round. He has a young guava tree, which is now loaded with fruit in its different stages, from the blossom to the perfect fruit. He has also the fig, the fast growing pride of China, [*melia sempervirens*] *the Paradise* or [*moringa pterigosperma*,] horse-radish tree, the *coidia sebestina* or geiger, the *princiana pulcherima*, the *agati coccinea* or scarlet dragon tree, castor oil tree, and last, though not least, the Spanish bayonet, [*agave floridana*.] It was transplanted from one of the adjacent islands in March of 1839, it was then about four feet high and the leaves two feet long; in the last of August it began to send up a straight green stem about six inches in circumference, it is now 25 feet high, and crowned at the top with a large bunch of flower buds; it is a curiosity which might well be an object of envy to proprietors of green houses at the north. Opposite this yard is another in which may be found five species of cotton, at this time in blossom; the Indian almonds, [*terminalis catappa*,] the mamey apple, the aligator pear, the pine-apple, the *sapodilla*, the dwarf banana, [or *musica coccinea*,] the *heliconia bihai*, the *hedychium coronarium*, the *achania malvaviscus*, the *tecoma capensis*, *cobela inflata*, &c. &c. On the north-east side of the island is situated the house and yard of the proprietor of the island; it is shaded by the splendid cocoa-nut palm of different sizes. The oldest were planted in 1825, and are now bearing, yielding a bunch every month in the year. He has also a few of the date palms, the gooseberry tree [or *ciccaracimosa*.] the pomegranate, hog plum, white malaga grape, plantains, bananas, papaws, red mulberry trees, coral trees, and various other ornamental trees and shrubs. On the side of the island facing the gulf stream, may be found the seven year apple, the gumbolimbo tree, [*bursera gummifera*,] which is valuable for fence-posts on account of its tenacity of life; for it immediately takes root, and in a few years large trees are formed from every post. That which first attracts the attention of a stranger when viewing the variety of plants and their rapid growth, is the *remarkable fact*, that we have not a particle of either sand or clay, the soil being purely carbonate of lime tinged with vegetable mould. And to a traveller, the contrast between this and the northern states at this season of the year is truly delightful. To day the thermometer has been at 83° and every thing abroad is sunny and beautiful, like a day in June at the north; indeed it is here almost a perpetual summer, and with our refreshing sea breeze, salubrious climate, sunny skies, ever blooming verdure, and purely calcareous soil, who can deny that this is truly a "*gem of the ocean?*"

EXPERIMENT OF COMPOST MANURE FOR CORN.

For the Farmers' Register.

In the fall of 1838, I penned my mules while seeding of wheat, and littered the pen with corn-stalks, top-fodder, oats and straw. In March, there being a considerable portion of, as I thought, good manure for corn, but not enough to manure more than 20,000 corn hills; I concluded to put pine leaves or beards, and lime with the manure. Therefore I put manure at the ground, then pine beards, then lime, then manure and so on, until it was all heaped; let it lie until the the corn was planted, and then manured 50,000 [corn-hills] in the hill. This corn was not injured at all by the chinch-bug, although they were to the very rows on the other corn that was not manured or limed. There was about 4 bushels of lime used in this manure, and the mules were penned about three months. The land would not have produced more than two barrels of corn to the acre, but for the experiment; it produced at least six barrels to the acre, this the 31st of October, 1839.

SAMUEL W. COUSINS.

Chestnut Grove, Amelia.

DESCRIPTION OF A FARM IN THE WESTERN EXTREMITY OF EASTERN ROSS, ROSS-SHIRE [SCOTLAND.]

Presented by Mr. John Baigrie.

From the 'Reports of Select Farms.'

This farm, consisting of about four hundred imperial acres, was, prior to 1825, occupied by numerous small tenants, who farmed the land on the old system which prevailed in the highlands of Scotland about fifty or sixty years ago—viz., the continued occupation of the ground by some description of corn crop, with exception of the small portion allotted for potatoes.

Their rotation—if rotation it may be called—consisted of oats, chiefly of the dun or black variety, which were continued to be sown in the same field in many instances for five or six years, or so long as the produce yielded two returns. When thought sufficiently exhausted, a portion was then manured in the spring for bear or bigg, and for potatoes—succeeded again by oats, which were continued until the effects of the dung were no longer visible, when the land was allowed "to rest"—*i. e.*, to remain unploughed for a period of years, producing nothing but weeds, with a small portion of indigenous grasses, no artificial seeds being ever sown.

The arable land of this farm was detached in small patches, of from two to three acres, interspersed with considerable tracts of brush-wood and uncultivated ground, on which stones, which have for centuries been collected from the land, have been allowed to lie. In addition to this accumulation of small stones, large masses of blue granite lay amongst the arable ground, above and immediately below the surface, so as to offer considerable interruption to the plough. The land was besides in a very wet state from the many springs issuing out of it, and there being no drains nor ditches to carry them off. So much was this felt in some seasons, that it was frequently the month of May before any corn was sown.

Such was the state of the farm in March 1825, presenting serious obstacles to improvement, but at the same time possessing capabilities which could not be overlooked, and which promised ample remuneration for the expense proposed to be incurred.

As the farm which forms the subject of the following remarks was, at the period alluded to, almost in a state of nature, the writer, in the hope it may prove useful, purposes giving a detailed account of the various operations connected with its improvement.

The farm lies on the slope of a hill and facing the south, and consists of two varieties of soil. 1st—a clay loam of from twelve inches to two feet deep chiefly upon an open gravelly subsoil. 2d—gravel mixed with a large portion of black mould from six to fifteen inches deep, also on a pervious subsoil.

Possession of the arable land having been obtained in the spring of 1825, in consequence of the right to the sowing of the crop of that year by the former tenants having been purchased from them, as well as the manure they had made from the previous crop, operations were commenced on the farm in the month of March. The first object was to lay off the arable land, as well as what was intended to be trenched, into fields of a regular shape, varying in size from twelve to twenty-five acres, according to circumstances, when such of them as could not be taken in hand in one season were sown with oats so far as the arable land extended. One field was selected for turnips and another for fallow; but from the scarcity of manure, in the first season, the sowing of both wheat and turnips was necessarily confined to a small scale.

Draining.—As draining was evidently the first necessary operation, a number of laborers were employed for that purpose, who executed the work by the job or piece. The drains were cut from three to four and a half feet deep, according to the nature of the substratum, two and a half feet wide at the top, and sixteen inches at bottom—the width at the top varying in proportion to the depth. Stones were then put in to the height of thirty inches, an opening of six inches square being left and built in the bottom to provent the sides of the drain from falling in and thereby impeding the running of the water. Above the stones, a covering of dried weeds, gathered from the land, was laid, to prevent the mould from mixing with the stones; after which the drain was filled up, taking care to throw in the subsoil first The expense of opening and closing was two-pence per ell of thirty-seven inches, and a half-penny per ell for carting the stones, making the whole expense of the drains three-pence per lineal ell. This sum appears a low price for the work, but an expert laborer, although he should require to use the mattock to gain twelve inshes of the depth, will, at the price, earn from two shillings to half-a-crown per day.

Blasting stones.—While the draining was going on, men were employed to blast the large stones, some of which lay on the surface, while other showed only a small portion above it, and many were not discovered until the field had got the first ploughing.* These stones, the greater number of which would weigh several tons, were blasted with gunpowder to a size which would enable two men to lift the pieces into a cart. Such of the stones as were below the ground, or had a part only buried, the contractor for the blasting was bound to clear around them, *i. e.* expose the whole of the stone to view, for the reason that, when the stone exploded, it might have room to fly asunder. When this operation is neglected, much labor and expense are lost. The expense of boring, blasting, and clearing the stones, including gunpowder, was fifteen pence per foot of bore, but latterly, by competition, was reduced to a shilling per foot. Many stones required thirty feet of bore to reduce them to a size fit for building stone fences, to which purpose they were to be applied.

Trenching.—As the two fields intended for turnips and fallow contained several acres of uncultivated ground, chiefly covered with hazel, alder, and birch wood, these were trenched by the spade to the depth of sixteen inches, turning up all the stones except those requiring to be blasted. The draining and stone fences going on at the same time, these stones were immediately carted off; the large to the fences, and smaller ones to the drains. The expense of trenching varied considerably, according to the hardness of the soil, quantity of stones in it, and thickness of the brushwood: in general, where all these prevailed, the expense was fourteen pounds per acre; when not covered with brush-wood, eleven pounds per acre.

Fences.—On one side of a field in which drains were cut, a ditch was usually formed, both as a fence and as a conductor of the water from the drains, in one side of which a hedge was planted, formed of a single row of white-thorn, paled on that side to protect the hedge until it should be able to protect itself. The dimensions of the ditches are seven feet wide at the top, three and a half feet deep, and eighteen inches wide at the bottom. The expense, including the setting of the thorns, was sixpence half-penny per ell.

It has been found from experience that where there is a considerable fall in the ground, as on the farm described, the ditches which follow the slope of the hill should have been causewayed in the bottom, to prevent the injury done to them by the winter floods. This might have been done at a comparatively trifling expense before the small stones in the adjoining fields had been otherwise disposed of.

Where ditches were not necessary for the purpose of carrying off water, dry stone dykes or walls were built, both as being the preferable fence where cattle or sheep are pastured, and for the purpose of using the stones which were procured from the trenching and blasting. These dykes are three feet at the base, and carried to the height of four and a half feet of built work, tapering at the top to a breadth of ten inches, and topped above all with a Galloway coping, or stones placed on edge, of about ten inches high, making the whole height five feet four inches. The expense per lineal ell including the driving of the stones, which the contractor for the dykes generally performs, ran from ten pence half-penny to a shilling. The stones, however, were near at hand, which enabled the work to be so cheaply executed, and grass was found for the contractor's horses on the unimproved ground. The price for building is sixpence per ell, and the difference was allowed for the carriage of the materials.

Preparation for turnips.—The field already alluded to, which was intended for turnips, being sufficiently drained, and the stones and brush-wood cleared off from the arable and trenched land, so many ploughings and harrowings were given as were necessary to clean the field from couch or root weeds, which were, after each harrowing, carefully hand-picked. The first three ploughings were not made deep, the more effectually to bring up the weeds; but after the cleaning process was ended, the land got a very deep furrow.

Liming.—The land of the farm described being generally of a rich and deep quality, but containing no calcareous matter, it was considered that the application of lime would be attended with beneficial effects, and the result has exceeded the most sanguine expectations. It being well known that lime acts more powerfully on new soil than on land which has been long in cultivation, it was desirable that some fresh mould should be taken up to mix with the old soil before the lime should be applied. For this reason a deep furrow, as already mentioned, was given to the land. Some persons for this purpose use four horses, but as those on this farm are very powerful, and the land not being of a cohesive nature, two were found competent to the task. The lime, which was all imported from Sunderland, was landed about four miles distant from the farm, and when carted to the field was laid down in a long heap or mound contiguous to water, if possible on one side of the field on which it was to be applied. Two laborers are then employed to turn the lime, and a third waters it. When the whole has been gone over, it is allowed to lie for four or five days, when it is again turned, and if any part of the lime should be found to be still unslaked, more water is added.

This mode of slaking lime is considered preferable to the very common one of laying down the lime, as it is taken from the ship or kiln, in small heaps on the land, to be slaked by the atmosphere, or by the moisture of the soil, which in dry seasons, is thrown upon it. By the former method every particle of the lime is reduced to a powder, which seldom happens the other way. The only advantage attending the latter mode is, that the quantity per acre can be more correctly applied; but any one who has had experience of the method recommended, knows from the appearance of the lime on the ground whether it be above or below the intended quantity. It is apprehended the more effectual slaking of the lime, and consequently the more equal distribution of it on the land, more than compensates for the additional labor of turning, watering, and carting it out. The quantity per acre applied to the field for turnips was one hundred and eighty bushels. When the whole lime has been spread on the land from the carts, the field gets one turn of the harrows, both for the purpose of mixing the lime with the soil, and to prevent any of it from being carried off by high winds.

Turnip sowing.—At this stage the drilling for turnips commences, the drills being made twenty-seven inches apart, when the dung, which had been previously carted to the field and well fermented, is laid in the bottom of the drills, taking great care that it is regularly spread. This is of greater consequence to the success of the crop than is generally imagined.

In this instance no more than nine tons per acre could be allowed, as no other manure could be procured; and bone dust, now so generally and successfully used, was not known here at the time.

Sowing commences about the 8th of June, and continues till the end of the month, and is performed with a double drill machine in the usual way. The kinds of seed sown on this farm are field yellow, green topped white, and white globe, commencing with the yellow and finishing with the globe. Swedes were obliged to be discontinued, as the hares are so numerous as to destroy them before the season arrived when that valuable root is generally used. They could have been taken up and stored, but their quality would have been injured by long keeping. The yellow, which grow to a greater size than the Swedes, supply their place, as they stand the frost nearly as well, although their quality is deteriorated earlier in the spring, on account of their greater tendency to shoot.

The produce of the field first improved was very great; but as no portion of it was weighed, a correct estimate of the crop cannot be given—it considerably exceeded in bulk any crop the writer ever saw on old improved lands. This may be accounted for from the circumstances of a turnip crop being new to the soil, and from the application of lime to the fresh mould taken up.

Fallow for Wheat.—As the greater part of the dung purchased from the former occupants was applied to the turnip field, eight and a half acres only could be manured for wheat.

In the cleaning process the treatment was in every respect the same as in the turnip field. As the land is deeper and rather more compact, it got two hundred bushels per acre of lime, and about twelve tons of farm manure, both being applied immediately before the last or seed furrow.

Wheat sowing.—The seed, which was procured from a chalk farm in Kent, was of the white sort, and was sown about the middle of September, at the rate of three and a half bushels per acre.

Produce.—The eight and a half acres of wheat yielded the very great return of forty bushels per acre; and it may be mentioned that the last crop of oats which the same land produced to the former tenant, was so bad as scarcely to pay the expense of cutting it down.

In the following year a small field of twelve acres, treated in every way like the former, with this important exception, that it got no manure, produced thirty-six bushels per acre.

These great returns may be ascribed principally to the operation of the lime on a deep and naturally rich soil, to which no calcareous manure had ever been previously applied. But as the peculiarly fine season of 1826 must have had considerable influence on the productiveness of the crops of this farm, which is situated considerably above the level of the sea, it must be mentioned, that in no subsequent year did the crops yield so much, although the bulk on the land was frequently greater.

In the manner already described, improvement of the other fields was conducted until the whole farm had been gone over, which was nearly effected in November 1828, being little more than three years and a half since operations were commenced. It being an object with the propietor to carry on the improvements with all possible dispatch, a considerable number of laborers were consequently employed, which caused the improvements to be completed in little more than half the time that in ordinary cases would have been necessary.

It must be here stated, that, although from the scarcity of manure in the first season, the number of acres sown with turnips and wheat were necessarily very limited, other improvements, as trenching, ditching, inclosing, &c., were proceeding on a large scale.

It added in no small degree to the labor, that, during the period alluded to, upwards of fifty thousand bushels of lime were carted a distance of four miles to the farm, on a road of considerable ascent, and without any assistance from hired carters.

Establishment.—The farm, during the continuance of the improvements was worked by a bailiff, six ploughmen or carters, and three laborers, in constant pay, and six pair of horses; but as a considerable portion of the farm is now kept in grass, and two fields in permanent pasture or meadow, the number of horses is reduced to four pairs and a supernumerary horse.

Expense of improvement.—As it may be satisfactory to give an idea of the expense of the improvement of some of the fields, two are selected; the one the most expensive, the other the least so. But it must be observed, that in stating the items of expense, no price is put upon the labor of the farm horses in carting the lime, fallowing, &c., which would at least come to five pounds per acre.

21-*Acre field.*

Blasting large stones, - - -	£75	0	0
Trenching, 6½ acres, at 12*l.* 10*s.* per acre - - - - - -	81	5	0
Drains - - - - - - -	3	0	0
Lime, 3,024 bushels (144 bushels per acre), at 6½*d.* - - -	81	18	0
Inclosing with stone dyke - -	52	7	0
Average, per acre, 13*l.* 19*s.* 6*d.*	£293	10	0

12-*Acre field.*

Blasting large stones	£8	16	5
Trenching	4	0	0
Drains	0	15	6
Lime, 2,304 bushels (192 bushels per acre), at 6½*d*.	62	8	0
Ditch for intercepting hill water	7	10	7
Average, per acre, 6*l*. 19*s*. 2*d*.	£83	10	6

This last field is that alluded to as having yielded thirty-six bushels of wheat per acre after fallow without manure.

Rotation of crops.—All the fields on the farm having been gone over in the manner already described, the previously exhausted state of the land, from a continued course of bad farming, rendered it necessary that, in the first round of cropping, it should be allowed to remain in grass for two or more years, for the purpose of recruiting its strength. With that view each field, as improved, was sown down with red and white clover and perennial rye-grass, in the proportion of eight pounds of red clover, four of white, and one and a half bushels of rye-grass per acre.

An easy rotation, or such as would least deteriorate the soil, was therefore fixed on, and is now followed. On that part of the farm, consisting of a deep clay loam, the course commences with—1. Fallow, a small portion of potatoes and spring sown tares. 2. Wheat sown down with grass seeds. 3. Clover. 4. Pasture. 5. Oats.

On the lighter division the rotation is—1. Turnips. 2. Barley, with grass seeds. 3. Pasture. 4. Pasture. 5. Oats. It is probable that this may be the course of cropping which will continue to be pursued. A more profitable one could be adopted by extending the course, and introducing beans, succeeded by wheat, into the rotation; but as the farm, as already mentioned, is situated considerably above the level of the sea, and in the immediate neighborhood of high hills, the bean crop, in most parts of Scotland a precarious one, would, in this situation, be doubly so; and the further extension of wheat would also be hazardous.

Farm offices.—These are conveniently situated, being nearly in the centre of the farm, and are of the most approved construction, possessing ample shed room for cattle, granaries, &c., and have a water thrashing-machine of eight horses' power attached.

Roads.—Besides a county road, which bounds the farm nearly its whole length, there are cross roads, which intersect it at convenient distances.

Sheep walk.—Connected with the arable farm described, there is a range of moor ground, interspersed with valleys of green pasture, on which fifteen hundred sheep are kept, of the pure Cheviot or white-faced breed. Surface draining being much wanted in the valleys, many thousand ells of drains were cut, which have had the effect of increasing the quantity and improving the quality of the pasture. The dimensions of the drains are twelve inches deep and twenty inches wide, and are executed at a farthing per ell. The sod that is cut out is carefully placed at the edge of the drain, with the grass side up, to preserve the green sward. The sheep walk, in consequence of its being joined to the arable farm, has the advantage of superior wintering for the hogs or lambs, on account of the green food and shelter afforded by the woods that are attached to the farm. As the wedder lambs are annually sold, no turnips are given to the ewe lambs, but in lieu of them they are allowed the range of the clover stubbles, which has equally the effect with turnips of checking braxy, a disease that often carries off a large portion of the flock where clover stubbles or turnips cannot be obtained, laxative food being the only preventive hitherto discovered. The sheep are managed by a head shepherd and a boy.

General character of the district.—The district of Eastern Ross consists of soil of all the varieties of loam, from a rich deep clay loam to light sandy loam; and as the climate of the lower parts of the district is favorable for raising wheat, that grain is cultivated to a considerable extent, and the quality in general is fine. In a few instances the wheat from one farm has brought the highest price in Mark Lane.

On the first-mentioned soil the system of cropping is as follows:—1. Fallow and a small portion of turnips. 2. Wheat sown down with grass. 3. Clover. 4. Oats. 5. Drilled beans, potatoes, and spring-sown tares. 6. Wheat.

On lighter loams the rotation is—1. Turnips eaten off with sheep. 2. Spring-sown wheat. 3. Clover. 4. Oats. 5. Beans, &c. 6. Wheat; and on the light sandy loams the mode of cropping is—1. Turnips eaten off with sheep. 2. Spring-sown wheat and barley. 3. Clover. 4. Pasture. 5. Oats.

Advantages of eating off turnips with sheep.—The farmers of the second and last mentioned soils derive very considerable benefit from the neighboring county of Sutherland. In that county sheep farming is carried on systematically, and on a very extensive scale; and it forms part of the system to winter on turnips the wedder hogs or lambs of that season, as well as the weaker part of the stock. As the turnips raised in the county are not adequate to feed the proportion of hogs from an aggregate stock of 156,000 Cheviot sheep, together with the cattle reared in the country, the farmers have recourse to this district and to Ross-shire generally, to make up the deficiency. The consequence is, that many hundred acres of turnips are annually taken by the Sutherland farmers in this county, the advantages of which to the district are obvious, as the land on which the turnips have been eaten by sheep is so enriched as to enable many farmers to grow wheat where otherwise it would not be attempted.

It is the general practice to draw off one half of the turnips, taking every alternate drill, to give to cattle in the straw yards. This is required both on account of the necessity of converting the straw into manure, and to prevent the land, where otherwise in good condition, from being over enriched by the sheep.

Another reason may also be stated. As it is only after turnips that wheat, on such soils, is raised, it is important to have the field cleared before the 10th of March—the latest period, in this district, at which wheat is sown in spring.

The raising of wheat on light sandy soils has thus become a practice where, not many years since, it was unknown; and, as that grain produces more straw than any *other*, and consequently more dung is obtained, a greater breadth of turnips is the natural result.

Size of farms.—The size of the farms in the district is, of course, various, depending on the extent of capital of the tenants; in general they run from two to four hundred imperial acres. The best description of lands let as high as two pounds per acre, while the inferior sorts are as low as fifteen shillings.

Very few cattle are fatted for the butcher, as the small towns and villages afford a limited consumption; but a spirited farmer from the south of Scotland, who rents two extensive farms in the district, has for several years been in the habit of feeding a considerable number of sheep, which he drives, a distance of about two hundred miles, to the Edinburgh market.

This tedious land journey will soon, it is hoped, be rendered unnecessary, by the adoption of a mode of conveyance to be afterwards noticed.

No dairies are kept, as, on account of the great distance from large towns, it is found more profitable to rear cattle on farms where a considerable portion is kept in pasture.

A considerable number of cattle are reared in the district, but as these are not sufficient for the consumption of the winter keep, the additional numbers are supplied from the Highlands of Sutherland and Ross-shire.

Almost all the farmers rear their own horses. At an earlier period, and before good stallions were introduced into the country, the local farmers' societies offered premiums for the best horses from Clydesdale and other southern districts of Scotland; but of late years, good stallions are annually sent north without any other encouragement than is afforded by the number of mares they obtain. A few are bred and kept in the country, but they are generally of inferior stamp.

On well-regulated farms, where the working stock are kept in full employment, it is usual that the ploughmen or carters do little other work than that in which their horses are engaged. All other work is performed by laborers, either by the day or by the job; the latter, in all cases where the nature of the work admits of it, being the preferable mode of employing them.

Method of working and feeding the horses.—In the spring and summer months the horses are worked ten hours per diem. The ploughmen are in the stable a little after four o'clock, A.M., to clean it out and to dress and feed their horses. They are ready to start at five; between seven and eight their breakfast, consisting of porridge and milk, is sent to the field, and after a few minutes, they are again in motion. At ten the horses are unyoked, and remain in the stable until two, when they again start for the afternoon yoking, which lasts until seven.

These hours of working are considered the best, as the horses are at rest and feeding during the heat of the day. In the interval, the ploughmen, by turns, cut clover or tares for the horses, which are carted home by a supernumerary horse that is generally kept for that and other purposes. During hay-time and harvest, or when the corn is carrying, no specified hours of working the horses are kept. In winter, when the weather admits of it, the horses are in the yoke, except an hour and a half in the middle of the day, as long as there is daylight.

The mode of feeding the horses varies according to the ideas of the farmers, but the general method is as follows. During the spring months they get one feed of oats in the morning at ten o'clock; when they come in to the stable they get a mash of boiled light grain and turnips. Before they start again at two, another feed of oats is given, and when they cease working at seven the mash is repeated. Some farmers substitute Swedish or yellow turnips for the mash of boiled grain, which is found equally to answer the purpose of keeping the horses fresh, and in a good working state.

In summer, when the horses are fed on cut clover or tares, it is not usual to give them oats, as unless they are bruised, a practice not sufficiently attended to, it is not supposed they could be much benefitted by them. In the winter months the horses get one feed of oats in the morning, and either mashes or raw Swedes in the forenoon. At eight, P.M., they are dressed and littered, and get a repetition of the mash. When there is much carting, as in driving lime, &c., the quantity of oats is increased. Hay and bean-straw form the rest of the food; and as there is little demand for the former, it is probable the horses get a larger proportion of it than they would otherwise obtain. Hay or straw-cutting does not prevail here as in England.

General remarks.—Improvements, such as practised in the south of Scotland, commenced in this country about the beginning of the nineteenth century, previous to which period judicious management was followed only by the more enlightened proprietors on their home farms. A few of the respectable native farmers studied agriculture in the improved counties in the south of Scotland, and the example which they showed in the improvement of their farms was gradually followed by their neighbors.

The rent of lands in the southern districts having considerably advanced at this period, induced farmers from these quarters to look to this country. The proprietors being sensible of the advantage that might be expected from the example which they would set to their other tenanty, granted leases considered at the time mutually beneficial in regard to enclosures, &c. These men immediately commenced the improved system of fallowing and sowing turnips, &c., and brought with them superior implements of husbandry. Although not uniform in their success, from the circumstance of their taking farms of an extent beyond their capital, by which a few became bankrupt, the native farmers saw the success of a portion of them and observed that their crops of wheat, beans, &c., were brought to maturity. They also perceived the great superiority of their management in having turnips for their cattle in winter, by which so much additional manure, and of better quality, was produced, and the cattle kept in a growing, healthful state, instead of being, as by their own system, kept barely alive during the winter months.

The improved mode of farming having gradually extended to the larger native tacksmen, the smaller tenants, and even the crofters, took the hint, and at this period (1831) a crofter who only pays a rent of five pounds has his patches of wheat and turnips.

The opening of the country by the Caledonian canal has materially contributed to its improvement; as, independantly of what may be expected from it for the general purposes of commerce, it affords the means of transporting the wheat of this district and of Morayshire, to the Liverpool market, which of late years has been the principal outlet for that grain. This arises from the circumstance that, from the dry nature of our climate, better wheat is raised than in the west of England and Ireland. The voyages through the canal are, however, frequently tedious, as the winds, confined by the mountains, generally blow from either end, and often for long periods. This can be obviated by the application of steam, and after the very large expenditure on this great national work, the expense of this power seems quite trifling, compared with the advantages to the navigation of the canal. By the aid of government, and under the direction of parliamentary commissioners, extensive lines of excellent roads and good harbors have been constructed. Another important improvement is on the eve of being set on foot, namely, the establishing of steam-boats for the purpose of carrying fat cattle and sheep to the English and southern Scottish markets. The benefit of this conveyance must be very sensibly felt, as the loss of weight and other casualties which fat stock experience in their tedious land journey at an early period of the year, and when food is often difficult to be procured on the road, very much lessen the profits of the feeder. The greater expense per head which the transport by steam must occasion, will, it is thought, be more than counterbalanced by the superior condition of the animals on arriving at market.

Character of the peasantry.—Like our Scottish peasantry in general, the inhabitants of this country may be said to be religious; are of sober, industrious, and peaceable habits; obedient and respectful to their superiors; and are willing to be instructed in any thing connected with their occupation by which they can make themselves more useful.

REMARKABLE GROWTH OF MORUS MULTICAULIS ON A SOIL ALMOST PURELY CALCAREOUS.

Capt. Jacob Houseman, Present.

Indian Key, T. F., Nov. 14, 1839.

Sir—The Editor of the Farmers' Register, at Petersburg Va., desires to obtain facts concerning the morus multicaulis of perpetual growth on the Florida Keys. As you are the oldest accidental introducer of the Manilla mulberry on this arid calcareous rock, I beg you to communicate any facts accidentally observed by you in relation to the original trees and to their recent progeny.

Very respectfully,
Your obedient servant,
Henry Perrine,
Superintendent of the T. r. C.

Dr. Perrine,

Indian Key, Nov. 14, 1839.

Dear Sir—Agreeable to your request for the history of my morus multicaulis, I say that I ordered at New York, a lot of plants, (the invoice of which is dated 28th February 1834,) consisting of apple, peach, plum and mulberry trees, which were set out as soon as they arrived at this islet. I did not know what kind of mulberry were the two trees, but I dug a hole in the limestone rock and planted them, where they grew very thriftily. The next year they bore fruit abundantly, when I trimmed them and cut off a cart-load of branches and sprouts, and hove them away, not knowing that they would grow by sticking them in the ground. As the trees were in the way, I dug them up and transplanted them, but one died from the misconduct of the negroes. I however, continued to trim the branches of the remaining tree from three to four times a year, and still continued to throw them away until about a year ago, when I learned from Mr. Howe that by cutting off the limbs, and cutting them in short pieces and by sticking them in the ground they would grow. I then planted 20 cuttings to try them, and now the bodies of some are three inches diameter, and from 12 to 15 feet high. The great growth of these plants and the great stories of the morus multicaulis, was the reason why some leisure days in the last summer and fall I stuck in the ground more than ten thousand cuttings of the new branches, all which are now from two to three feet high, well covered with large leaves. The soil is nothing but a shelly kind of gravel and sand, not more than from one to two feet deep to the solid coral rock.

Your humble servant,
Jacob Houseman.

To Charles Howe, esq., Present.

Indian Key, T. F., Nov. 14, 1839.

Sir—The Editor of the Farmers' Register, of Virginia, is desirous to acquire facts concerning the growth of the morus multicaulis on the Florida keys. As you are the oldest practical propagator of the Manilla mulberry on this coral rock, you are hence respectfully requested to communicate any important facts from your immediate personal observations in this entirely tropical climate and on the entirely calcareous soil.

Very respectfully,
Your ob't. servant.
Henry Perrine.

To Dr. H. Perrine, Present.

Indian Key, Nov. 16, 1839.

Sir—In reply to your request of yesterday, I briefly state that my personal observations on this little island have satisfied me of the important facts that the morus multicaulis is here in the very best section of the United States for its profitable propagation; because the Manilla mulberry is here an evergreen tree, which bears leaves the whole year round, and because it therefore does furnish food for silk worms and does furnish buds for planting on every day of every year. Mr. Baker of Charleston, S. C. sent me nine plants of the morus multicaulis, about two feet high, which I planted on the 23rd December, 1836; and on the 2nd January 1837, the leaves had become the size of a dollar. On the 12th January 1837 I hatched 50 eggs of silk worms, and fed them on the young leaves of said plants, by picking all the leaves on each plant in succession; and when the ninth plant was stripped, the first plant was again covered with leaves; on the 22d February, 1837, I sent to Charleston, S. C. several cocoons spun by those worms fed on those leaves; that is in two months the leaves were grown, the worms were fed, and the cocoons were spun, in the worst days of a northern winter. In relation to the propagation of the Manilla mulberry, I will briefly state that I have planted cuttings and transplanted trees at any season of the year, whenever a rain fell, and I was at leisure at home. I have memoranda of planting in October, November, December, January, March, April, June, August and September. Those cuttings planted on the 24th April last, are now 5 to 6 feet high, and those planted on the 20th September from 10 to 15 inches high. Considering the want of vegetable mould and of every earth except limestone, and then comparing the small size of my lot with the great number of trees huddled together in the lot, it does seem wonderful that any one should grow at all. Nevertheless, you daily see that they are all flourishing with the greatest vigor and luxuriance in the continual reproduction of their enormous leaves.

Very respectfully,
Your obd't. servant,
CHARLES HOWE.

To the Editor of the Farmers' Register.

I send you the preceding copies of my correspondence concerning the morus multicaulis with the only persons on this islet who possess any plants of the Manilla mulberry. You know that this islet embraces only twelve acres of land, and is inhabited by only six families including my own. Capt. Houseman is the principal proprietor of the island, Charles Howe, esq. is the postmaster and inspector of the customs, and their families include the only persons who have resided on this islet during the last ten years. You will perceive that neither of them has yet adopted the prolific practice of propagating with single buds, as both of them are apparently satisfied that the value of the leaves for fodder for cows is, at the least, equal to their value for food for worms, and that the conversion of those leaves into milk by milch cows is a much speedier, safer and easier process, than the conversion of those leaves into silk, by silk-worms. Indeed, neither Capt. Houseman nor Mr. Howe, has the leisure or the disposition to multiply the Manilla mulberry to the greatest possible extent, in the least possible time; and have not hence derived any pecuniary gain from the superlative superiority of South Florida, for the profitable propagation of the morus multicaulis and for the continual production of raw silk.

Very respectfully,
Your obd't. servant,
HENRY PERRINE.

Indian Key, T. F., Nov. 16*th*, 1839.

P. S.—As regards the moveable material here called soil, I do not believe that when equally distributed over the whole island, it would make an average depth of six inches to the solid rock.

H. P.

[We had long ago observed the peculiar fitness of calcareous soils to favor the growth of mulberry trees; and besides the economical value of that fact, it was the more interesting to us because of our investigations and observations previously made in regard to sundry other trees and plants which have either a marked preference for, or as marked an aversion to, calcareous soils. When therefore we heard, from Dr. Perrine, that morus multicaulis plants were growing on the almost pure calcareous soil of Indian Key, a mere disintegrating coral rock, we felt curious to be more fully informed as to the degree of congeniality between this tree and a soil so unfavorable to most other trees, and indeed to vegetation in general; and our inquiry has elicited the remarkable and interesting facts presented in the foregoing correspondence.

The remarkable power of growth of this tree on a soil so nearly approaching to sterility, on account of its being so nearly a pure carbonate of lime—and which will soon become entirely steril by tillage, without due care for giving and retaining in it vegetable matter—is of far more importance than merely to feed silk worms, (important as we deem that object,) or to produce trees for sale. Supposing not a cent to be derived from either of these sources, the discovery of the peculiar aptitude of this tree to grow on such soil is alone equal to double its value for other purposes. For it will give a luxuriant and shading forest growth on what would be otherwise a burning and arid region, and which otherwise, after being exhausted by tillage of its little stock of vegetable matter, would become not only destitute of fertility, but of grass and of trees, and consequently of moisture. The growth of this tree offers, directly, abundance of cattle-food, and of wood for fuel, and perhaps timber for many purposes; and indirectly, it will aid the product of every other crop, by the cover of trees producing vegetable food, and also by inviting and retaining the moisture of the air. We may be visionary in this opinion; but we do certainly and fully believe, that the two facts so recently known—the nature of this soil, and its fitness for producing mulberry trees—if properly appreciated and applied, may make all the difference between a productive and delightful agricultural region, and a naked, parched, and unimproveable and scarcely habitable desert.—ED. FAR. REG.]

CAPITAL INVESTED IN AGRICULTURE BOTH SAFE AND PROFITABLE.

From the Maine Farmer.

At the present time when there is much derangement in commercial concerns, and when the world seems filled to a surfeit, with all kinds of stocks, it may not be improper to pause a moment, look around us and see what sort of investments have stood the tests which the various circumstances of a political and commercial nature have brought to bear upon them. Is that portion of capital which is invested in the thousand and one speculations of the day, as safe and as productive as the holders desire? Do the banks exhibit in their returns, such an enormous dividend that makes their stock so very lucrative that it is an object to invest in them largely? We think not. If we take the whole amount of bank dividends in this state and average them upon the amount of capital stock, they will hardly amount to four per cent. Look at the various other kinds of fancy or other stock, which have swallowed up so much of the capital of our own citizens—very few of them yield six per cent. Again, look at the active commercial part of the community. Group them all together and sum up the profits and the losses, and average them among the individuals, and will their profits be so great and so splendid that it would be cause of envying the proprietors? So unsettled has been business, and so full of uncertainty and fluctuation, that hundreds and thousands, who have entered the field of commercial enterprise with some little capital—the fruits of their own or their fathers' industry—are now in fact deeply insolvent, and in truth pennyless, however well they may manage in concealing it by the use of other people's property.

Well, how is it with capital invested in agriculture? How is it with funds invested in the soil and the improvements of a well managed farm? Are they any more productive, or are they, in fact as far in the back ground as the votary of commercial speculation would fain make the world believe? We believe that if we take the amount of capital invested in any well conducted farm, and carefully calculate the net proceeds, it will be found that it is more productive than most of the investments of the present day. Let us take for instance any particular crop. The oat crop is as fair a one as any to calculate upon.

Let us first estimate the amount of capital to produce a crop from an acre; and first we will give what in this state may be considered a large price, especially if we were to purchase a whole farm at the rate, we will give $50 for the acre,

	$50 00
Ploughing,	2 00
Seed,	1 25
Harrowing in,	1 00
Interest of cost of acre for one year,	3 00
	$57 25

We will give the straw for harvesting and thrashing, and we have now invested fifty-seven dollars and twenty five cents.

We will suppose that you get thirty bushels of oats, and that is a crop hardly worth bragging about. Our friend Ford, of Gray, gets 66 bushels per acre, but we will take thirty bushels, only *thirty*, and will sell them for less than we gave in the spring for seed. We will sell them for 37½ cents per bushel, which will amount to $11 25. Now eleven dollars and twenty-five cents is the interest of $187 50, at 6 per cent, or in other words, is more than nineteen per cent upon the interest of capital invested, including purchase money and all. But as you have the acre still on hand, deduct if you please, the $50 which you gave, and the expenses will then amount to $7 25. This then is the actual floating or circulating capital required to produce your acre of oats, including rent or interest of purchase money, and the nett income, $11 25, is about 155 per cent. *Fiddlestick*, exclaims neighbor Scrubard—now this is all humbug—real book farming. Any body can get rich on a piece of paper. If money can be made so easy by farming why *ain't* I and every one who have been farming all our days as rich as mud? *I don't believe nothing on't.*

Well neighbor, put down your goodstick and let us enquire into it. How large a farm have you? One hundred acres. What did you give for it? $2000, that is $20 per acre. The interest of this is $120. Well then I have to pay about $20 in taxes, that makes $140, then I have to hire help, two men six months in a year, and work hard myself the year round. Well we will give you all twelve dollars per month, that will be $144 for yourself and $144 for your men; equal to $288, which added to the interest and taxes, $140, makes $428 outsets or circulating capital. Then there is the interest on the cost and wear and tear of tools, you have reckoned. Well we will give you $72 to pay for that, which is in the interest of more than a thousand dollars for your tools and implements, but we will give you that sum, which added to the $428 will swell it up to $500. Now how in the world do you pay this $500 but off of your farm?—mind you, this $500 is what you invest, year after year—it is the interest of your first investment of $2000 for your farm, payment to yourself and men for labor, &c. &c. Now how much land do you cultivate and how much hay do you cut? I cultivate twenty-five acres, and mow twenty-five—I have twenty-five in pasture and twenty-five in woodland.

Produce.

2 acres of Indian corn,	50	bush.	worth	$50 00
4 " potatoes (light crop)	1000	"	"	200 00
5 " oats	150	"	"	56 25
6 " barley	120	"	"	80 40
5 " wheat (light crop)	50	"	"	50 00
3 " rye	60	"	"	60 00
40 tons of hay worth $6 per ton				240 00
Total				$736 65

Thus the whole amount of your crops are worth $736 65, making due allowance for rust in your potatoes, and weevil in your wheat, and not rating the other very high, either in amount per acre or at a high valuation in the market. We have charged you nothing for seed, and although we have allowed you full wages while sowing, cultivating and harvesting, we have said nothing in regard to the value of the straw, husks, &c. You have thus realized $236 65 more than a return of your circulating capital, which is more than 47 per cent. Ah, well—this looks might well on a paper, but it isn't *cash*. The merchant and the broker have the *clean cash*, while we poor farmers have to go without the rhino, if our barns and cellars are ever so full. What then? it is what will purchase cash—it is property, it is substantial wealth. If you were under the necessity of buying this amount of produce in the markets you would find that it was worth something. Scrubard looked somewhat puzzled. It is true, said he, it would cost a good deal to buy what even a poor farmer may raise; but after all where is one that does as well as you have figured out, there are ten who run astern and *finally* come out of the little *eend* of the horn. Grant yon that neighbor, and what is the reason of it? They do not invest capital enough in their business, either because they have not got it, or because they are too penurious. They may cultivate a few acres well, which yields them a good profit, while they suffer nine tenths of the rest of their farms to lie idle, and the interest on the cost of these acres eats up the profit of the few that they do cultivate. We have said nothing of the income from your pasture or your woodland.

If the position here taken be true, and we challenge scrutiny, and beg to be put right if we are wrong; how much better would it be if those who are now farmers by profession would, if able, devote more capital to their business instead of diverting it as many do into other channels and engaging too largely in other business.

Any one who rides through the state cannot but notice the thousands of unimproved acres on either hand. How much better would it be if more of our young men would take hold of the business of farming instead of aspiring to a life of *apparent* ease in commercial pursuits. It is true that the farmers crops are sometimes cut off; but not oftener than are the hopes of the merchant. Mildew and hail and rain, and hurricanes sometimes destroy the fruits of the earth; but not oftener than do the elements work destruction upon the ships of the importer.

Life is full of vicissitudes, and risks and changes in whatever place or pursuit you can engage, but, taking every view we can of the whole, we are convinced that capital invested in agriculture is most safe and profitable.

WINTER BUTTER.

From the Genesee Farmer.

The best and the richest butter of the year is that made after the vegetation of the year is developed in May and June, as the food is sweeter then than any other time. But notwithstanding all the care that can be used, in ordinary cases, such butter cannot be preserved through the summer, in a state fit for winter's use. There can be no doubt that packed in jars perfectly close, entirely freed from buttermilk or extraneous matters, salted in the just proportion with pure salt, and kept at a temperature below 50°, the butter of June would be in perfection in January. The combination of favorable circumstances, however, can be rarely obtained, and farmers, as well as others, who did not keep milch cows for the purpose of supplying them with milk and butter through the winter, must rely on butter packed in autumn for their winter supply. Too many farmers, we think, are in the habit of delaying the providing their stock of butter too late in the season. The reasons for this are, it does not require as much care in making and working the butter to make it keep well, as it would if made earlier in the season; and if made late, and after a low temperature has arrived, packing may be dispensed with, or at least, may be performed very imperfectly. But such late made butter has several disadvantages. It is usually made from vegetation that has been more or less frost bitten, and therefore does not produce milk of the richness and purity which is essential to the making of the best butter. Further, as the grasses decay, range of feeding by the animals is increased, and vegetation, which at other times would be refused by the cows, is now eaten with avidity by them. If the farmer has a good supply of pumpkins or carrots which he can feed to his cows, he can make first rate butter at any time; but unless he is so provided, his stock of winter butter should be put down before his cows are driven to subsist on food that will be sure to deteriorate the article. The tops of almost any of the cultivated roots produce a greater effect on the butter than the roots themselves. Thus when we have fed out the tops of the ruta baga to our cows, the effect on butter has been very distinct and disagreeable, while in that from the cows fed on the roots and hay very little alteration of taste was perceptible. Such butter should not be used for keeping, as it never grows better. Too much of the butter offered in the markets of this country is only fit for the soap-makers, and to them it should be consigned.

IMPROVED METHOD OF TRAINING RASPBERRIES.

From the Floricultural Cabinet.

Cut out all the weakest shoots, so as to leave only about six on a stool; then twist the point of one shoot from one stool with one shoot from the stool adjoining, so as to form an arch. Do the same with two other shoots of each plant, so as to form a triple arch between plant and plant, in the direction of the rows, all through the plantations; the space between the rows being left open as usual. The plants should be six feet apart every way. The fruit produced by the trained canes will be fully exposed to the direct influence of the sun and to the air, and there will be more room for the suckers.

APPLE MOLASSES.

From the Ohio Farmer.

There is many a good housewife, who has more faith in her own experience, than in the science of chemistry, that knows not the value of apple molasses; but still believes it to be the same kind of tart, smoky, worthless stuff, that has from time immemorial, been made by boiling down cider. It is not within my province, at this time, to attempt to convince such that there is a chemical difference; though it might easily be shown, that they are almost as different as sugar and vinegar. I would, however, invite them to lay aside their cider this year, and try the plan of boiling down the juice of the apple that has not been exposed to the air by grinding and pressing.

"Last autumn I placed a number of bushels of Wetherill's sweeting apples in two large brass kettles, with water just sufficient to steam them; when they boiled soft, I turned them into a new splinter basket, containing some straw, and placed on them a barrel head, and a heavy weight. The juice was caught in a tub. This was repeated until I had juice enough to fill the kettles, when I commenced boiling it down, and attended to it strictly, frequently skimming it, till it became of the consistency of cane molasses. The native acids of the fruit imparted a peculiar flavor, otherwise it could hardly be distinguished from the syrup of the cane. It was used in my family for making sweetmeats, for sweetening pies, for dressing on puddings and griddle cakes, and a variety of other purposes. The cost of making it is very trifling, and the means are within the reach of every farmer.

ERASURES OF SUBSCRIPTIONS FOR NON-PAYMENT.

Subscribers in arrear are requested to read the third rule of the editorial convention. (See the rules annexed to the Conditions, on the cover, as well as in many earlier publications.) This rule will, at the close of this volume, be for the third time strictly enforced, and as it will be also hereafter at the end of every succeeding volume. Each enforcement of this rule has swept from our list from one to three hundred "*patrons*" of this journal, and but few of whom would have been discontinued by their own order. But our *pledge*, and other cogent reasons require that the rule shall be truly and fully complied with; and it *shall* be done even if at the total loss of all such subscribers, of their favor, and of their existing debts.

The usual "credit system" of periodical publications, or rather *non-paying* system, if not thus or in some way checked, is enough to break down even the most popular and extensively circulated journals. Indeed the more extensive and widely diffused circulation causes the greater proportional loss. We have already adopted measures (in the present conditions of publication) to restrain this enormous abuse, and which measures, if generally availed of, would be alike beneficial to the subscribers and to the publisher. And if the effort is appreciated and properly seconded by the real supporters of the Farmers' Register, the "cash system" will be adopted without exception hereafter.

MONTHLY COMMERCIAL REPORT.

For the Farmers' Register.

The suspension of specie payments in this country caused less alarm in Europe than we had apprehended. American stocks had previously declined to so low a rate as to put a stop to sales. The Bank of England was obtaining considerable reinforcements of specie, and no apprehensions of suspension by her appear to have been entertained. The average prices of grain were lower, and the duty had consequently increased; but this is ascribed more to the inferiority than to the superfluity of the harvest.

In this country every article of domestic produce has declined in price during the present month. Tobacco $5½ to $6 in the large markets, and wheat $1 10 to $1 15, at which rates extensive shipments have been made. Cotton in the great southern ports has fallen to 7 to 10 cents; and the threats of monopolizing and witholding it from market are not likely to be executed.

Supplies of new tobacco have been large this month, and the general range of sales $3¼ to $7½.

Exchange on New York may be quoted 5 per cent. premium, and on London 17 to 18.

Stocks of all kinds continue depressed. The banks have been temporarily relieved from the penalties incurred by suspension, but money continues scarce. The want of small change is a great and growing evil, but individuals do not, as on a former occasion, issue small bills. I.

December 21, 1839.

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FORWARDING
By the Richmond & Petersburg
RAIL-ROAD.

Goods sent by this Railroad will, if so directed, be forwarded to any point on the line of the Petersburg and Roanoke, or Raleigh and Gaston Railroads, and goods sent by those roads to Richmond will be received from the depot in Petersburg and brought on. The depot agent at Pocahontas, will attend to the forwarding, but this company will not be liable for accidents or losses, except as at present on its own road. The freight and passage through, on goods sent from Richmond must be paid there in advance, and on goods ent to Richmond may be paid either here or in Petersburg. A forwarding commission of 10 per cent. n the freight of this road must be paid to the agent, which will be received with the freight and drayage.

Goods will in like manner, be forwarded to, or received from any point on the line of the Richmond, redericksburg and Potomac or Louisa rail-roads, uner the care of the freight agent at Richmond.

Richmond, Dec. 20.—n&atf.

TO PLANTERS,
on and near the Appomattox,

FORWARDING BY THE
Richmond and Petersburg
RAIL-ROAD.

Produce sent down the Appomattox, will, if so directed, be forwarded by this Rail-road to Richmond. he Depot Agent at Pocahontas, (Mr. Squires,) ll attend to the forwarding from the Basin in Pesburg, and pay the drayage. The Company will t be liable for accidents or losses, except as at present, on its own road. A forwarding commission of) per cent. on the freight of this road will be charged, the Agent, and received with the freight and drayage.

Produce sent to be forwarded, should be accompanied a letter from the owner to the Agent, to be delivered by the boatman at the depot in Pocahontas immeately on his arrival.

☞ Freight on tobacco $1 per hogshead, on wheat ents a bushel.

Richmond, Dec. 20, 1839.—n&atf

MORUS

MULTICAULIS TREES

r sale.—15,000 to 20,000 trees from cuttings, plant1 1st February last. They are in rows 5 feet apart, d 18 inches from tree to tree. Being planted so wide, d having had careful cultivation, they are now unommonly fine, most of the trees being from 7 to 10 et high, and so filled with branches as to completely ut up the 5 feet alleys, presenting to the eye, a field the richest vegetation. Apply to

JOHN MILNE.

Beaufort S. C., Oct. 18th, 1839.—a3t

ERMS OF ADVERTISING ON COVER OF FARMERS' REGISTER.

For the space of 20 lines of a column, or less (or one uare,) $1 for the first insertion, and 50 cents for each ntinuance—*to be paid for in advance*, with the order r printing the advertisement. Half the above prices arged for advertisements in the '*Country Advertiser*,' sued monthly from the same office.

JUST PUBLISHED

And for sale at the OFFICE OF THE FARMERS' REGISTER, Petersburg, the second American, from the fifth English edition of

DAVY'S AGRICULTURAL CHEMISTRY.

The text of this last English edition is precisely that of the edition of 1827, which received the last improvements and alterations made by its illustrious author; and the notes added to this last, are from the pen of its editor, Dr. John Davy, the author's brother.

No American edition of this valuable work has been published from any later than the first English; and even of those early and imperfect editions, few if any copies can now be found for sale. The work, in booksellers' phrase, has long been "out of print;" and there are very few works that so well deserve to be reprinted, or are more essential to the library of every intelligent agriculturist.

In addition to the peculiar value possessed by this edition, as the *latest* and most perfect, it will be by far the cheapest yet published. By adopting the cheap form of the "Farmer's Register," "Essay on Calcareous Manures," and "Johnstone's Treatise on Draining, &c." the forthcoming edition of the "Elements of Agricultural Chemistry" can be furnished at one-fourth the cost of the earlier edition heretofore published in this country—and still lower compared to the latest English edition, of which this will be a full reprint.

This work well deserves, for its subject and intrinsic value, to be adopted as a text book in all schools of scientific and high grades of *useful* instruction; and for its *low price*, this edition, and other agricultural publications from the same establishment, might be economically and profitably adopted, as mere reading books in primary or common schools.

Price 75 cents the single copy, or $5 for 8 copies. The work will be sent by mail, or otherwise, for any cash payments and post-paid orders.

AGRICULTURAL BOOKS
FOR SALE AT THE
Office of the Farmers' Register.

The following publications are for sale at the Office of the Farmers' Register, and will be sent by mail, or otherwise as required, at the following prices, upon cash and *post-paid orders*.

	The single copy.	Or for $5 paid
Essay on Calcareous Manures, - - - -	50 cents,	10 copies
Do, on inferior paper,		12 copies
Johnstone on Draining, Embanking, &c., (latest edition,) - - -	75 cents.	8 copies.
Davy's Agricultural Chemistry, (latest edition,)	75 cents.	8 copies.
Directions for the management of Silk-worms &c. 2nd. edition, - - -	25 cents.	25 copies.
Treatise on Mulberry and Silk-culture, by GIDEON B. SMITH. - - -	12½ cents.	50 copies.

All, or any of these publications, may be obtained together, in any proportions ordered, at the wholesale prices stated, for remittances of $5, or more.

In answer to frequent inquiries, it is necessary to state that none of the publications of this office are in any case sent to booksellers, to be sold. Booksellers like all other persons, may be supplied on the above stated terms; or at a deduction of 20 per cent. on the above wholesale rates, for purchases of $20, sent in advance with the order. EDMUND RUFFIN.

April 30, 1839.

CONDITIONS OF THE FARMERS' REGISTER

For the EIGHTH and succeeding volumes. Prices still more reduced, for combined and punctual or advanced payments.

Art. I. The Farmers' Register is published in monthly numbers, of 64 large octavo pages each, at $5 a year, payable in advance. Or, for $5 may be had *two* copies of the same current or forthcoming volume, *for new subscribers*, if so ordered and paid for in advance, (or at the time of making the subscription,) in current money, as described below, (Art. VI.) and without loss or deduction for postage, or any other charge to the publisher.

II. Subscribers who may have already paid the regular subscription price of $5 in the manner above required, for a single copy, shall have the privilege, upon sending a *post-paid* order, of having a second copy of the same volume sent to any NEW subscriber, without further charge, for that volume, if so ordered during its time of publication.

III. A like privilege will be allowed to every old subscriber who has not paid, but who shall do so, as above, before the issue of the 6th number of the then current volume, (at which time of all debtors' bills will be made out and sent); thus in *effect* REDUCING TO HALF PRICE THE COST OF THE WORK TO EVERY SUBSCRIBER, OLD OR NEW, WHO MAY CHOOSE TO AVAIL OF THE OFFER. (See also Art. V.)

IV. If, however, no more than one copy is ordered, the subscription price will still be, as heretofore, $5 the volume; as it is not designed to permit any subscription debt, or payment, to be made for less than $5. And if an order is sent for two copies, without full compliance with the conditions annexed, (in Art. VI,) only one will be sent.

V. Clubs of ten subscribers (old or new, or of both) by sending $25 (net payment) in advance and at one time, before February 1st, of each year, shall be furnished with ten copies of that volume only.

VI. The price of back volumes, as heretofore, is $5 for one alone, $10 for any three together, and in the same proportion ($3.34 cents each,) for any number of volumes short of a full set. Entire sets of 8 vols. (the 8th commencing January 31st, 1840,) will be supplied for $20, or $2.50 the volume, paid in advance, with the order.

VII. ALL MAIL PAYMENTS MUST BE MADE IN NOTES, OR CHECKS, OF PAR VALUE IN VIRGINIA, or of a CITY bank of the state in which the subscriber resides. And all letters to the editor in regard to the Farmers' Register must be post-paid—except such as contain articles for publication.

VIII. The risk of loss of payments for subscriptions sent free of postage, which have been properly committed to the mail or to the hands of a post master, is assumed by the editor.

IX. For all copies not received by mail, at the proper post offices, duplicates will be furnished to those subscribers who *have complied with their own obligations*; provided that the failure *shall be notified through the postmaster*, and *within one month after the date of the miscarried copy.*

X. If a subscription is not directed to be discont
and before the first number of the next volume
been published, it will be taken as a continuance
another year. Subscriptions must commence with
beginning of some one volume, and will not be ta
for less than a year's publication.

XI. The mutual obligations of the publisher
subscriber, for the year, are fully incurred as soo
the first number of the volume is issued; and after
time, no discontinuance of a subscription will be p
mitted. Nor will a subscription be discontinued
any earlier notice, while any thing thereon rema
due, unless at the option of the editor, or in conform
to the regulations of the Editorial Convention.

Address— EDMUND RUFF

Petersburg Va., November 1st, 1839.

General Regulations adopted by the Edito
Convention.

The following [illegible] Virginia, w[illegible] ners' Register [illegible]

1. "All subscriptions must [illegible] red and due in advance, and for a year's p[illegible] specially ordered for a shorter time, and paid for in [illegible] that shorter time, when so ordered.

2. "No publication shall be sent to the order of any n[illegible] unknown subscriber, unless paid for in advance, or [illegible] reference be made to some known and accessible [illegible] good to the subscriber or his payment. But, in case of an [illegible] for a publication, without payment, from a new subscriber [illegible] is unacquainted with the conditions, a single number ma[illegible] sent, containing, or accompanied by, a copy of the regula[illegible]

3. "The names of all subscribers, whose credit is [illegible] be unknown to the publisher, and who may remain indebted [illegible] open account at the end of two years, from the time whe[illegible] advanced payment was due, shall be erased from the subscrip[illegible] sections."

[*Resolutions of the Editorial Convention at Ri*

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